

Radio Control

WIN A NEW CAR! pg.114
10 PRIZES IN ALL

CAR ACTION

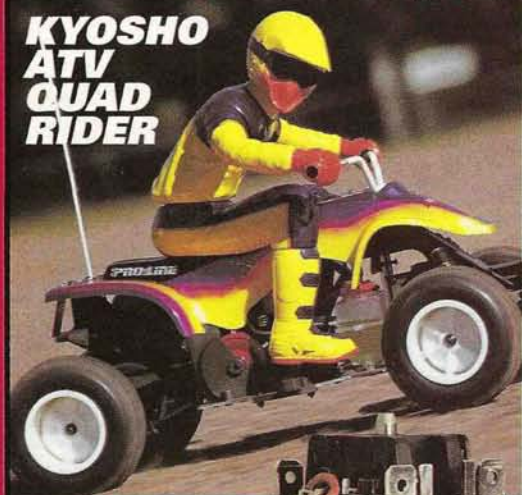
THE WORLD'S LEADING R/C CAR MAGAZINE

January 1999

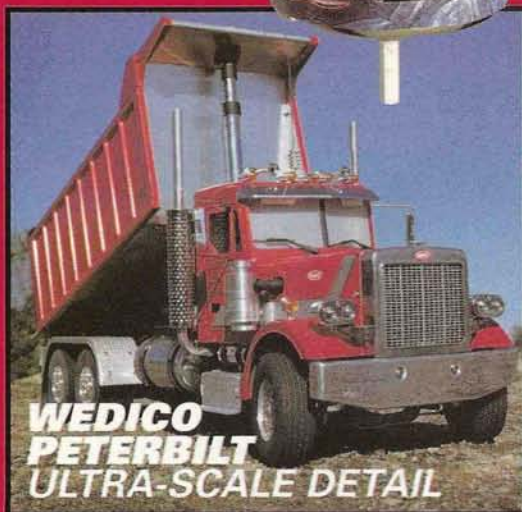


KILLER ELITE!
MUGEN 1/8 MBX-4

**KYOSHO
ATV
QUAD
RIDER**



**TRINITY'S
PARADOX
POWER!**
WORLD'S 1st
REBUILDABLE
STOCK MOTOR

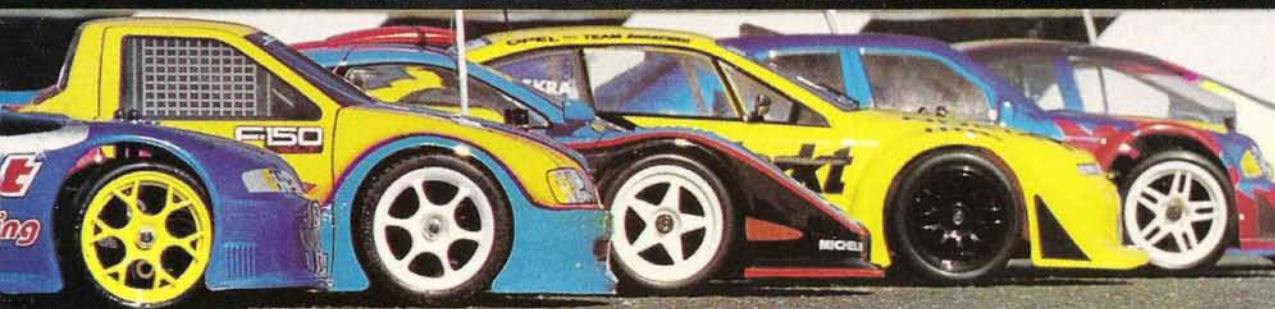


**WEDICO
PETERBILT
ULTRA-SCALE DETAIL**

**new
for '99**

**CARS
TRUCKS
RADIOS
TIRES
MOTORS
ELECTRONICS
BODIES
WHEELS
CHARGERS
BATTERIES ACCESSORIES & MORE**

**12 LOW-COST CONTENDERS
4WD SPORT TOURING CAR GUIDE**



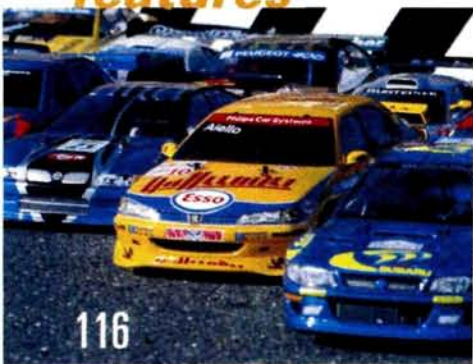
www.rccaraction.com

USA \$4.95 • CANADA \$5.95



0 09128 47380 2

features



116



196



142

thrash tests

72 Kyosho Quad ATV Rider

Quarter-scale quad • BY GREG VOGEL

80 Tamiya Mini Cooper Racing M-03

RoboCooper: Tamiya's class-creating mini is reborn • BY LOUIE PATTERELLI



88 Mugen MBX-4

Is this the ultimate 1/8-scale buggy? • BY STEVE POND

100 Tech Racing Voggerd GT

An alternative Pro Tourer
BY GEORGE M. GONZALEZ

52 New for '99

All the hottest gear from the Chicago hobby show

BY THE STAFF OF R/C CAR ACTION

110 FIRST LOOK! Trinity Paradox rebuildable stock motor

BY STEVE POND

116 4WD Sport Touring Car Guide

Touring's low-dough dozen

BY THE STAFF OF R/C CAR ACTION

142 Wedico Peterbilt Truck

Reality rig

BY STEVE POND

196 Reader's Ride of the Year

Greg Mutz's landscaping rig mows 'em down



110

216 FIRST LOOK! Yokomo YR4-M2 Pro

—a factory ride you can own

BY GEORGE M. GONZALEZ

230 2nd LOOK OFNA Nitro Z10 Pro

BY GREG VOGEL

departments

10 Starting Line

18 Readers Write

22 Readers' Rides

155 Racer News

- INNOVATOR AT WORK
—Peak Performance's Rick Hohwart
- SPEED SHOP
—Ride Competition Parts RQ Primer Surface Treatment and RQ-4 Instant Adhesive
—Hitec metal-gear servos
—Trinity polarized brushes
—MIP Side Pipe Kit, Boost Bottle and Rear Boost Chamber
- RACER PROFILE
—Team Associated/Reedy driver Jason Ruona
- NEWS FLASH
—Mark Pavidis ties the knot
- RACER TIP OF THE MONTH
—Travis Amezcua: Team Associated driver
- MINI HOW TO
—Add rear toe-in adjustment to your Tamiya TA03
- RACE COVERAGE
—Kyosho Off-Road Fuel Challenge

242 Product Watch

- Titan Tech hop-up parts
- Hammad Ghuman spring clamps, retainers and mounts for Associated shocks
- Pro-Line Dirt Hawg Buggy Tires

258 R/C Car Action Tech Center

263 Track Directory

272 Classified Ads

273 Manufacturer and advertiser contact information

columns

30 Pit Tips

BY JIM NEWMAN

34 Troubleshooting

BY DOUG MERTES

40 Concours Corner

BY KEVIN MEYER

46 R/C Doctor

BY DOUG MERTES

271 Chris's Back Lot

BY CHRIS CHIANELLI



Hypnotic Power

Those two words best describe the sort of influence

hot new gear has on us at *Radio Control Car*

Action, and we're sure the same is true for

you. That's why we're excited to bring you

news of all the latest releases from the

Chicago Hobby Show in this issue's

New for '99 section. With all those

fresh-from-the-mold cars, radios, parts, tools and

other goodies, you're sure to find plenty to get your heart

pumpin' and rev up your imagination. But be warned: when you see all the latest

innovations in R/C, you may be lulled into a trance-like state that could last days.

"Must ... buy ... new ... stuff"

Quick. How many "sport" touring cars are currently on the market? Would you guess

five? Or seven? How about nine? Does that sound like a lot? Guess again, gang; this

month, we test 12 sport tourers—an even dozen! I can't recall the last time a vehicle cat-

egory had this many entries. To help you decide which is the best budget parking-lot

machine for you, our **4WD Sport Touring Car Guide** gives all

the facts and features you need to pluck a kit off the shelf with confidence.

In addition to our full coverage of the sport-touring spectrum, this issue also gives

you a sneak peek at the latest pro-spec touring car to come from the Yokomo skunk

works. George Gonzalez' **First Look: Yokomo YR4-M2 Pro**

gives you a bench-top tour of this hot new sedan's trick parts and features, which are

many. The Pro is sure to be a powerhouse on the track; this might be your only chance to

catch up with one!

Speaking of powerhouses, motor monolith Trinity has a bold new concept for stock-

motor racing that is sure to stir controversy. Steve Pond examines the hardware (and the

issues) in his exposé on the new **Trinity Paradox stock motor**.

Will this new mill change the face of stock racing? You decide!

There's more: "Reader's Ride of the Year"; five big "Thrash Tests"; "Racer News." This

is our biggest issue ever, and it's packed! Park yourself under a good reading lamp (with

a snack), get comfy and enjoy.



Peter Vieira (peterv@airage.com)

Editor



EDITORIAL

Group Editor-in-Chief TOM ATWOOD

Senior Editors CHRIS CHIANELLI, STEVE POND

Senior West Coast Editor GEORGE M. GONZALEZ

Editor PETER VIEIRA

Assistant Editor GREG VOGEL

Editorial Coordinator DANA DONIA

Editorial Assistant MELISSA L. TOOTHILL

COPY

Copy Director LYNNE SEWELL

Copyeditors MOLLY Z. O'BRYNE, JANE HICKOK

Assistant Copyeditor COREY WEBER

ART/DESIGN

Managing Art Director ALAN J. PALERMO

Art Director BETTY K. NERO

Assistant Art Directors ANGELA A. CARPENTER,

ALESSANDRA CIRILLO, JOANNA WINN

Promotional Art Director LESLIE COSTA

Staff Photographer WALTER SIDAS

ADVERTISING

Director of Advertising SHARON WARNER

Assistant Manager JILL ELLEN AMALFITANO

Advertising Account Executives MONA TASSONE,

KATHRYN GEARHART, LAURA M. LAVALETTE

Advertising Traffic Administrator SIRI A. WHEELER

Advertising Coordinator ANN T. WIEBER

CIRCULATION

Circulation Director NED BIXLER

Circulation Assistant P.J. UVA

OPERATIONS

Director of Operations DAVID BOWERS

Advertising Services Coordinator THOMAS J. HURLEY

Prepress Production Supervisor CHRISTOPHER HOFFMASTER

Magazine Production Coordinator SHEILA STARK

PUBLISHING

Group Publisher LOUIS V. DeFRANCESCO JR.

Publisher YVONNE M. DeFRANCESCO

Associate Publisher SHARON WARNER

CORPORATE

Chairman DR. LOUIS V. DeFRANCESCO

President and CEO MICHAEL F. DOYLE

Vice President G.E. DeFRANCESCO

Secretary L.V. DeFRANCESCO

Treasurer YVONNE M. DeFRANCESCO



Member Audit Bureau
of Circulations

PRINTED IN THE USA



100 East Ridge, Ridgefield, CT 06877-4606, USA

Now Gear This

I have a question about gearing. There are 48- and 64-pitch gears—right? What is the difference in performance between them? Do 1/10-scale touring cars have to use 48-pitch gears? What are the advantages and disadvantages of these gears? By the way, I drive a Yokomo YR-4M2 Type-J PRO.

[email]
KEITH NG

Keith, 48-pitch gears have larger teeth than 64-pitch gears. It follows that larger teeth are less prone to stripping. This makes 48-pitch gears good for applications such as touring cars, in which 4WD traction and powerful modified motors put a lot of strain on the gears. Also, the larger teeth make for a greater mesh area between the pinion and spur gears, and this allows the gears to tolerate a larger gap between the pinion and spur without stripping (this is important for off-road cars, which must maintain gear mesh even as the motor plate flexes when landing off jumps or taking on bumpy tracks). Sixty-four-pitch gears offer other advantages: the smaller teeth offer a fine, super-smooth mesh, with minimal friction. Also, 64-pitch gears permit more gearing options. Let's say your car has a 48-pitch, 100-tooth spur gear and accepts pinions from 25 to 28 teeth. The same car could accept a 116-tooth, 64-pitch gear (which would be the same diameter as the 100-tooth, 48-pitch spur), but you would have more pinion options; you could use 29- to 33-tooth pinions, which allow you one more gearing option than 48 pitch. That's one more chance of finding the perfect ratio for your track! Of course, you can also change spur gears, and a one-tooth change in a 64-pitch system is more subtle than in a 48-pitch gear set. The downside is strength; 64-pitch gears don't take abuse well, so they are best suited to indoor racing, particularly pan cars. For touring cars like your Yoke, 48 pitch is fine.

—Pete

Monster Tired

First, I'd like to say that you guys put out an awesome mag! I'm a big R/C fan and recently helped two of my friends get into this cool hobby, which was great—except for one thing. My buddies purchased Team Associated RC10T3 team trucks, while I am the proud owner of an MRC MT-10M, which has been upgraded with bearings, an ESC



and a Trinity Midnight motor, with an Airtronics Rival Sport handling the controlling duties. Up to now, I had (in my opinion) a good truck, but suddenly, I'm eating dust. Yikes! These guys have Nightmare 1 and 2 motors, Novak 610 HRV ESCs and Futaba Magnum Junior radios. How can I hop up my truck to keep up with these guys? I'd appreciate any help you guys (and gals) could give me

By the way, Chris, I also have a dog with great wisdom: my 1-year-old golden retriever, Shadow. He is the source of all my creativity. Keep up the great work!
C.J. DAVID
Toledo, OH

C.J., I think your MT-10M's monster tires are the source of your speed deficit. You and your buds all run competition stock motors in bearing-equipped trucks with ESCs. Granted, their more expensive racing trucks probably handle better than your built-to-be-tough truck, but it sounds as though you're "eating dust" simply in terms of sheer go-power. Swap those giant treads for racing rubber (I would buy whichever tires your friends are running), and you should see quicker acceleration and more responsive handling. You should also install a pinion that's two or three teeth larger to compensate

for the new, smaller tires.

Give Shadow a Milk-Bone from me!
—Chris

Tracking Down a Track

Do you know of any tracks up in New Hampshire? I have been trying to find somewhere to race, but none of the hobby stores reply to my letters. I live right near Portsmouth. I would greatly appreciate any info. Thanks. [email]
DEAN JR.

Every other month, Pro-Line sponsors the Track Directory right here in *R/C Car Action*; it lists every track that we're aware of, nationally and internationally. The directory includes information on track type, hobby-shop facilities and more, along with a contact name, address and phone number. As a matter of fact, this is a "Track Directory issue," so check it out; you'll find a few tracks in New Hampshire. And to you track owners out there: if your track isn't listed, send us your information. Just follow the instructions on the form printed in the directory. It's free, by the way (OK, almost free; you'll have to foot the bill for a stamp).
—Pete

Smoke gets in your eyes

I want to get a Bolink Funny Car. I want the tires to look like they are smoking, but I don't really want the tires to smoke. I want to put something in the car that pours thick, white smoke out of the rear wheel wells. Do you know of a way I could do this? It has to be cheap, light, safe for the car, reusable/reloadable and easy to build and install. Thanks!
LEVI BOPP
Coon Rapids, MN

OK, Levi, let me think about this. Hmmm ... nope, doesn't exist. However, you have written a very nice mission statement for the creation of such a device. Personally, I would love to see an R/C car with the tires lit up like a top fueler! If a company marketed a tire-smokin' system, it would be "da bomb"—da smoke bomb, that is.
—Pete

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

INTERNET ADDRESSES:

Chris Chianelli: chrisc@airage.com
George Gonzalez: georgeg@airage.com
Steve Pond: stevep@airage.com
Peter Vieira: peter@airage.com
Greg Vogel: gregv@airage.com

Flyin' High

Great mag! I get every issue and read it cover to cover, over and over again. I saw the Nitro Thunder King on the cover of the November issue and flipped to the "Thrash Test." I read the first page and then turned to the next page and saw the photos of it flying through the air. I thought the truck would have shattered into a million pieces! I read the rest of the article and can't believe the truck landed in those flight sessions without disintegrating. This truck sounds awesome. I'm a backyard thrasher (I own a Stampedede) and have been looking for a user-friendly, durable gas truck. Is the Nitro Thunder King really as good as it seems? Will it be worth every dime I pay? I'm only 14 and would have to do a lot of odd jobs to pay for a new truck.
DREW STURM
Snohomish, WA

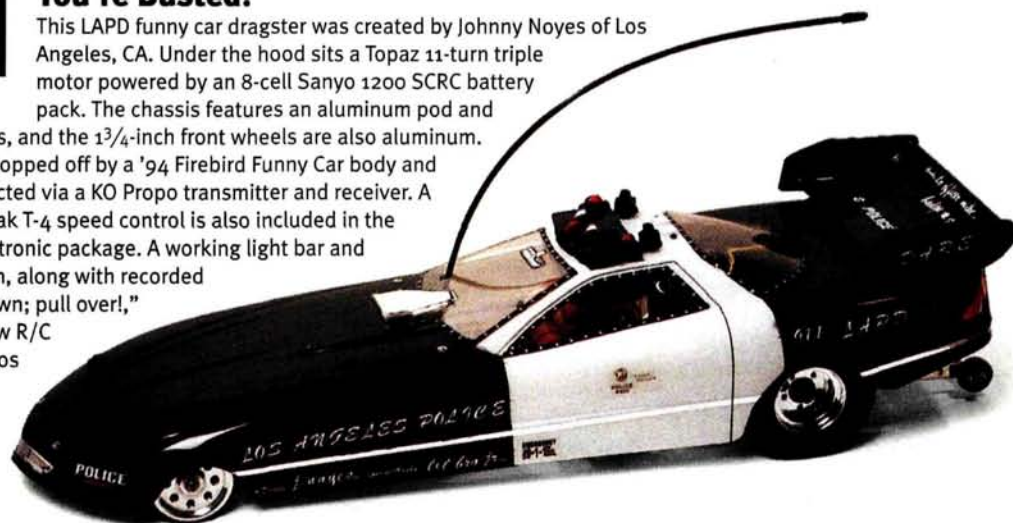
Since I was the one behind the controls during the "flight sessions," I'll answer your questions. By using the throttle and brake, I was able to manipulate the truck's flight attitude and land it on all four wheels. By landing on all fours, all the force of the impact is absorbed by the shocks and tires. Bad landings are what breaks a vehicle—any vehicle. Since the "Thrash Test," we've run the truck dozens of times and I'm pleased to report that it has survived. We handed the truck over to contributing author Kevin "Hinge Boy" Hetmanski, extreme hacker, and so far, he has only been able to break a rear wheel. He broke it during an R/C exhibition at a full-scale monster truck event in which he jumped a row of full-size cars. So in my book, if the Nitro Thunder King can survive the wrath of "Hinge Boy," it is worth all of your hard-earned cash.
—Greg

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. If we choose to feature your creation, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the ninth annual "Readers' Rides of the Year Contest" in the fall of 1999. In case we need to contact you, write your address and phone number on your letter and on the back of every photo you send. Good luck!

You're Busted!

This LAPD funny car dragster was created by Johnny Noyes of Los Angeles, CA. Under the hood sits a Topaz 11-turn triple motor powered by an 8-cell Sanyo 1200 SCRC battery pack. The chassis features an aluminum pod and hubs, and the 1 $\frac{3}{4}$ -inch front wheels are also aluminum. It's topped off by a '94 Firebird Funny Car body and directed via a KO Propo transmitter and receiver. A Novak T-4 speed control is also included in the electronic package. A working light bar and siren, along with recorded

instructions to "Slow down; pull over!," add to the realism. Fellow R/C enthusiasts living near Los Angeles: watch your speed!



Mirror Image?

Edwin Lee of Ridgefield, NJ, just can't get enough of his Acura Integra Type-R. First, he drives his full-scale vehicle to work, then he drives his 1/10-scale version in the parking lot. The R/C car is a Tamiya TA-02 topped off with an HPI body. A fiberglass chassis sits underneath. Other features include a Tekin TSC 408 S, Futaba Sport radio, Trinity 17X2 motor, Tamiya speed-tuned gear set, HPI touring car wheels and 1400 matches SCRs. Edwin credits his return to R/C with meeting Chris Chianelli at the '98 Tokyo Auto Saloon. Another "lost" fan found!



Sunny Delight

This brightly colored car built by Jason Kronenwetter of Sarasota, FL, seems to symbolize the Sunshine State. Among its features are full ball bearings, a torque splitter, a 427 Speedworks motor and a Novak Rooster speed control. A JR Racing radio system helps to steer the car. There are also working headlights, along with purple neon-like lighting underneath. Now, where are my shades?



Six Wheelin'

These two Traxxas Stampedes have been modified by Thomas Stegner of Detroit, MI. All four rear wheels on both trucks are powered. The black truck, aka "Truckzilla," has Clod Buster rims and tires, two Novak Cyclone ESCs, Thorp Dirt Burner gears, MIP CVDs and



eight DuraTrax shocks. Beneath the hood are two D3 14-turn quads. Thomas says the red truck, affectionately called "Fordasaurus Rex," is extremely fast for its size and weight. It features Losi shocks, two Opal 10-turn triples, two Novak Racer ESCs, Thorp Dirt Burner gears, MIP CVDs and some handmade aluminum parts. Looks like a "destroyer"!

Customized

Michael Rommel of Prince George, British Columbia, Canada, did some custom work with this Kyosho Lazer ZX-R topped off with a Parma '57 Chevy body. HPI tires and rims were bolted on after shaving the inside of the front rims and modifying some chassis parts. Michael says he also had to cut down the suspension arms and axles so that he could get the wheels inside the body. Furthermore, he narrowed both the front and rear of the chassis and shortened the shock travel. A front sway bar reduces body roll, while a 16-turn motor powers the vehicle. Michael also installed a Tekin 610R ESC. He says the car handles very well, and the finished product was worth the effort.



Sunday Best

Don't let the body fool you! Nate Wills of Aldie, VA, said this HPI RS4 Mini is heavily raced. It's merely dressed to impress here with a show body. Gear includes a Futaba 2PCKA and S9301, Novak 610-HRV, Novak Polaris, ESP 1700 SCRCs and a Trinity Diamond motor. Hop-ups include sway bars, super radials, GPM blue aluminum motor plate, full ball bearings, GPM front bumper and Litespeed connectors. Nate says he has started a small club called "Insane Mini Crew."

Converted

This Losi XX-T has been converted to a 'CR' by Adrian Duran of Corpus Christi, TX. Pro-Line Gladiator II rear tires and Losi Wedge fronts grip the ground. Upgrades include aluminum blue-anodized nut set, shock bushings, front bulkhead, front brace, rear brace and motor plate. Hammad Ghuman hub carriers, Fantom rear bulkhead and MIP gold shock shafts are stock. Adding to its good looks are several polished parts, including MIP shiny CVDs, titanium rods and pins, hand-polished MIP lite drives and chrome RPM wheels.



Smokin'

Sergio Amaral of Sao Paulo, Brazil, sent us this shot of his 1/10-scale Serpent Impact 2. It includes KO Fet 1004 servos, NovaRossi CX 15 engine, Centax clutch and a JR 756 FM radio. Topping it off is a BMW M3 body, with decals made by a plotter. Sergio races locally and in the Brazilian Season Championship. He said daily irritations are quickly forgotten when he runs the car. Sounds like a good way to de-stress!



Almost Twins

These two buggies created by Ryan Pratl of Palos Hills, IL, have similar components. Both the Team Associated B3 and Team Losi XX-4 are controlled by a Futaba 3PJ, Novak Mercury receivers and Cyclone speed controls. Gonzo 2000 matched cells and Wimpy Motors power them, and both have Lunsford hinge and tie-rod sets. Since this photo was taken, the XX-4 has been updated with MIP CVDs, a new chassis with a lower center of gravity and graphite arms, shock towers and belt covers.

PIT

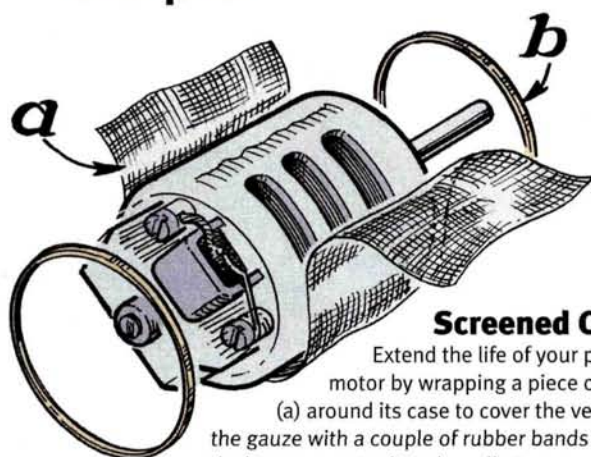
workshop ideas & innovations

BY JIM
NEWMAN

tips

HIGH PERFORMANCE RACING PRODUCTS

Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.

**Screened Out**

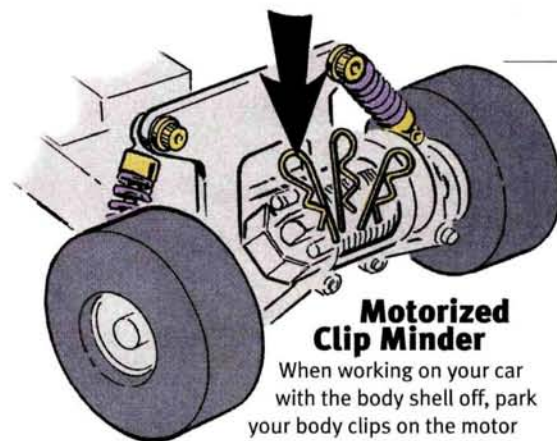
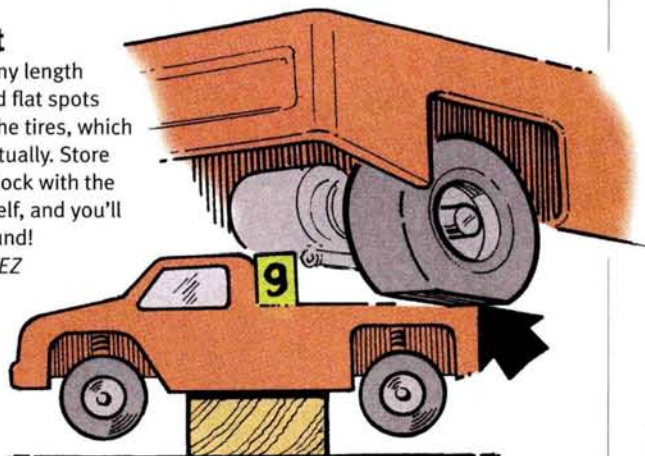
Extend the life of your precious motor by wrapping a piece of fine gauze (a) around its case to cover the vents. Secure the gauze with a couple of rubber bands (b) to effectively screen out grit and small stones.

CHRIS VOGAN
Rochester, PA

Don't be Flat

If your cars sit for any length of time, you will find flat spots on the bottoms of the tires, which will go away—eventually. Store your cars up on a block with the tires clear of the shelf, and you'll keep the rubber round!

DARREN HERNANDEZ
Ontario, CA

**Motorized Clip Minder**

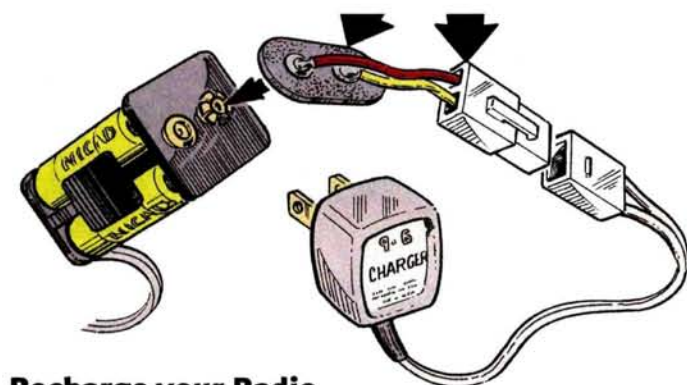
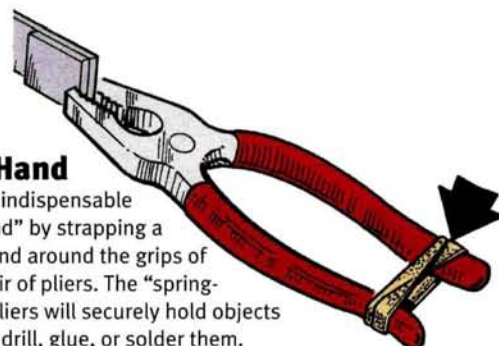
When working on your car with the body shell off, park your body clips on the motor case, where the magnets will hold them in place.

JEREMY EDGE
Pearland, TX

Third Hand

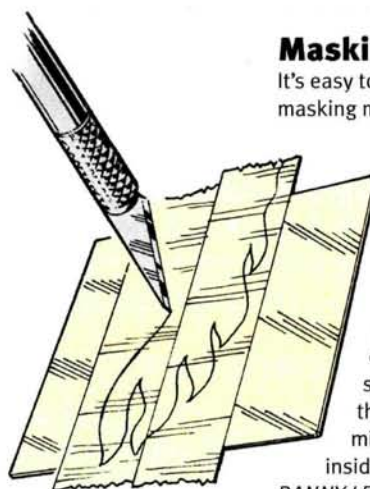
Create an indispensable "third hand" by strapping a rubber band around the grips of a large pair of pliers. The "spring-loaded" pliers will securely hold objects while you drill, glue, or solder them.

MATTHEW MORRIS
Scottsville, KY

**Recharge your Radio**

Why keep shelling out for fresh alkaline cells when you can power your transmitter with rechargeable Ni-Cds? To recharge the Ni-Cds, solder a RadioShack 9V-type connector (a) to a standard stick-pack connector (b) to match your battery charger. Charge at 2 amps or less.

MARK DEYOE
Brockton, MA

**Masking-Tape Master**

It's easy to make your own paper-backed masking material by using the slick backing paper from sheets of stamps or adhesive labels (floppy disk and videotape labels make good donors). Lay the masking tape on the slick side of the release paper, then cut the trim pieces to shape. The trimmed tape will easily lift off the release paper so that you can place it inside the body. This is easier than trimming whole tape applied to the inside of the shell.

DANNY LEUNG
San Francisco, CA

Captive Parts

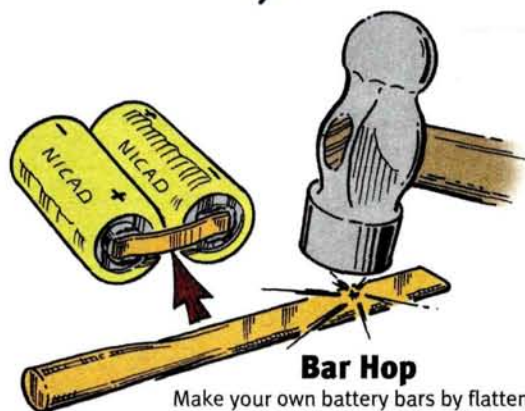
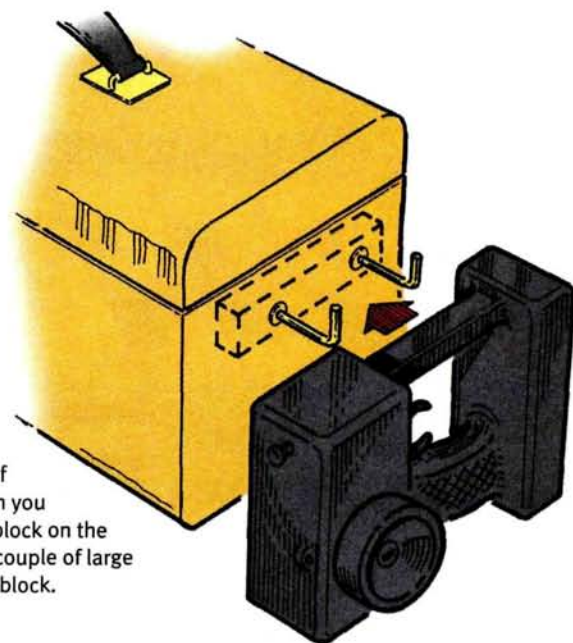
If your small parts and spares jump over the walls of your parts box when you carry it, glue foam blocks into the lid of the box. When you close the lid, the foam will gently hold the parts in their compartments.

STEVE CASE and
AMOS DUNCAN
Eugene, OR

Transmitter Tote

Hang your transmitter on the side of your toolbox to free up a hand when you walk to the pit area. Put a wooden block on the inside of the toolbox, then screw a couple of large hooks through its side and into the block.

ADAN SPAHN
San Diego, CA



Bar Hop

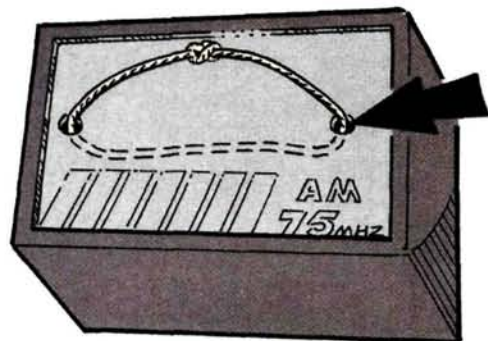
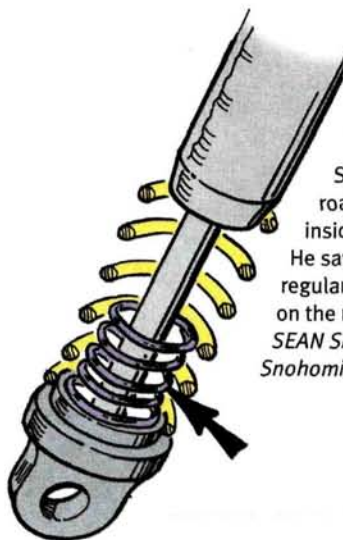
Make your own battery bars by flattening no. 8 or no. 10 copper wire. Holes may be drilled in the ends of the bars to help solder flow.

ROGER and ROWAN LEDBETTER
Snoqualmie, WA

Shock-Bottom Blues

Sean recommends cutting a stiff on-road spring in half then slipping it inside the regular spring on the shock. He says that this gives the plush ride of a regular spring but resists bottoming out on the rough stuff.

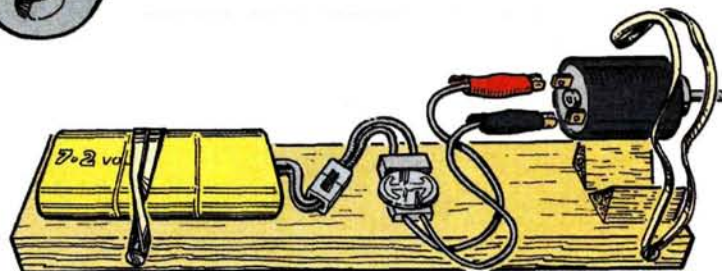
SEAN SMITH
Snohomish, WA



Cover Up

To facilitate crystal access on Airtronics XL2P and CS2P receivers, remove the snap-in cover and drill two 1/8-inch (3mm) holes through it. String a cord through the holes to create an easy-to-pull handle.

RYAN GREER
Discovery Bay, CA



Break-in Rig

A discarded mechanical speed control glued or screwed to a piece of 1x2-inch (25x50mm) wood makes an effective bench-top throttle for motor break-in and testing. The pack and motor are simply rubber-banded into place.

EDDIE JARAMILLO
Belen, NM

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at *Radio Control Car Action*, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

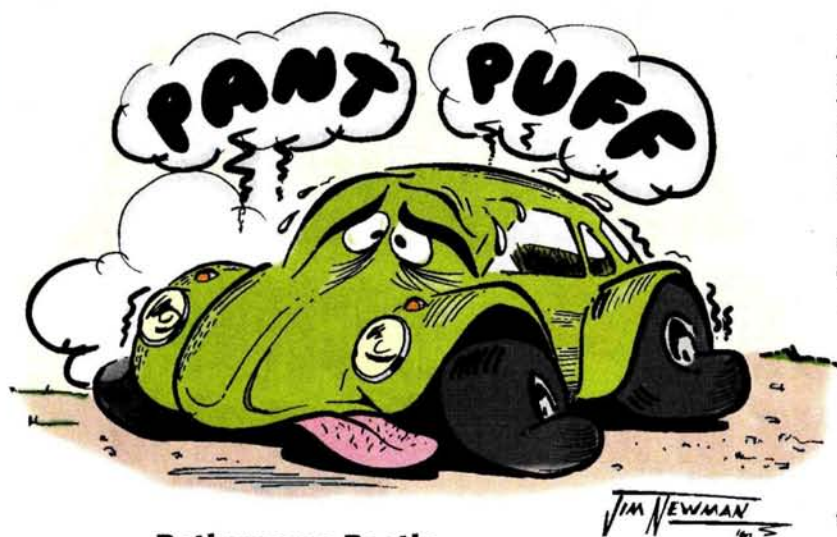
Spur-Gear Solution

I always read your "Troubleshooting" column, and now I have a problem I hope you can help me solve. I have run an Associated RC10GT for about a year and a half, and I've always had difficulty with the spur gear. I've probably gone through 20 spurs since I started running my truck! I have used Loctite on all of the screws, so nothing is coming loose or moving around. I use 64-pitch gears, but I'd really like to find a stronger gear or a metal spur. Can you figure this one out?

ALBERTO VASQUEZ
Sun City, CA

Alberto, this one is easy to solve; it's impossible to have 64-pitch gears on an RC10GT! The RC10GT comes with 32-pitch gears, and to the best of my knowledge, all of the clutch bells currently available for the GT are 32-pitch. Even if they could be converted, I wouldn't do it. There is no way that a 64-pitch gear would stand a chance in a GT.

The next possible solution is that you have confused the model name of your truck, and that you are actually running an electric truck. If that's the case, then it's at least possible that you could be running 64-pitch gears, but I still wouldn't recommend it. You would not want to run anything finer than a 48-pitch gear on an electric truck.



Bothersome Beetle

My Modellsport FG Eco-Line 1/6-scale off-road Beetle dies after about 10 minutes of run time, during which it consumes approximately 1/3 tank of fuel; the fuel bulb empties. I can pump it up again, but the Bug won't start until it has cooled for a few minutes. The fuel-tank mixture is correct (4 ounces of 2-cycle oil to 1 gallon of super unleaded gas), and I have tried various high- and low-end carb settings. The engine is a 22cc Zenoah 97 (with an Extreme Heat Sink Head and competition tuned pipe) mounted straight up with a K&N air filter and high-temperature metal plug cap. The car runs great—when it runs. I have talked about this problem with the company that sells the vehicle; they recommended that I install the optional fuel-tank vent kit. I did, but the car still quits after only about 10 minutes. I would appreciate any help you can offer.

JOHN NORTON
Williamsport, PA

John, according to what you wrote, the engine is not starved for gas yet it stops running when it gets hot. Putting more gas in the tank doesn't make it run right away, so fuel (or more correctly, the level of fuel in the tank) isn't your problem. You say that you use the high-temp plug cap, and that's a good thing, but it obviously hasn't solved your problem.

One thing that I learned when I worked with high-performance, 2-cycle motorcycle engines is that when they get too hot and stop running, it's usually a symptom of one or two common problems: piston/cylinder clearance, or ignition. Some of these engines radiate so much heat that the ignition coil gets steamy and can't operate properly, especially when the coil is mounted close to the cylinder head. You may want to try moving the coil a few inches away from the engine or inserting some sort of temporary heat shield between the head and the coil to see whether that cures the problem.

It's most likely, however, that the piston/cylinder clearance is too tight. The piston and cylinder are made of different materials, so when the engine heats up, they expand at different rates. When the clearance is too large, you get poor compression. When the clearance is too small, the piston will literally seize in the bore after about, oh, 10 minutes of run time. Sound familiar?

I suggest that you remove the cylinder head and measure the piston-to-cylinder clearance, and then check it against the specifications in the engine owner's manual. While you're in there, inspect the bore and see if there's some smeared aluminum on the cylinder walls; that's a sure-fire indication that the piston/cylinder clearance is too tight (or that it used to be), or that the engine was run too hot and was about to seize. If things inside the engine don't look too bad, you should be able to get away with a hone job on the cylinder and some new rings. A final possibility is that the fuel mixture is too lean. Check your engine manual to determine where to make the adjustment, then richen the mixture slightly.



Slo-Mo Stampede

When I drove my Traxxas Stampede recently, it seemed much slower than usual. It has been as tough as nails, even though it's pretty much stock except for Pro-Line Road Hawks and a Trinity Midnight Motor. I checked the brushes and gears, and they seemed OK. Do you have any ideas?

By the way, I was the "unknown racer" pictured in the November '97 issue!

JOSH URBACH
Aurora, CO

Josh, check the indicator LED on the speed control to see whether the high-speed LED lights up at full throttle (if your speed control is equipped with one). If it doesn't light up, then not all of the battery voltage is getting to the motor.

If the ESC is functioning properly, remove the motor and check it out. If the brushes are worn to the point at which they are about half the length of new ones, replace them. Also check the commutator for deep scars in its surface and, if necessary, take it to a hobby shop or to a racer who has a stock comm lathe and have the comm cut to freshen it up. While the motor is out, spin the wheels and the transmission to see if anything is binding or tight. Too much resistance in the drive train will slow you down just as surely as a dead battery pack will! If you do all of these things, I think you'll find something along the way that will explain your unexpected slowdown. Top racers conduct this examination process often. Want to become a "known racer"? This is how to do it!

Tire-Eating Sedan

I own a Tamiya TA03F-Pro, and I must say that it's a delight to drive. I owned an older TA02 sedan for several years, and the newer design really is far superior! Unlike my older car, however, the TA03 seems to eat tires and rims. With my other car, I ran an entire season on a single set of new tires, but now I have to replace the front wheels and tires after only three or four weeks, and the back ones don't last much longer than that. At first, the edges of the rim gets eaten up, and then the tire wears out right at the shoulder, where it curves from the bottom to the sidewall. I've checked carefully around the wheel wells, and I can't seem to find anything rubbing on the wheels or tires, but I still keep wearing them out. I hope you can help me because I can't afford to replace many more tires!

[email]
DAVE MAKEM

Dave, you're right; the newer, TA03 design really is faster. I suspect that the new car's increased performance is eating up your tires.

The TA03 is capable of far higher cornering speeds. When you slow down slightly for a turn, the car's weight shifts forward, and this makes the front suspension collapse slightly. The weight then shifts to the outside wheels as you approach the apex of the turn. This combination of weight and speed puts a lot of strain on the sides of the tires just above the rim; it distorts the tires' contact patches, and the sidewalls bear the brunt of the turning force. Add to this the generally softer compounds that have become common (they stick better and add cornering potential, but also become distorted more easily), and you have a real handful to deal with.

You should be able to solve some of the trouble by installing adjustable upper camber links. I found that adding a degree or two of negative camber (wheels leaning inward toward the center of the car) not only gave my 03 better steering, but it also cured a similarly worrisome wear pattern. Another option would be to use firm tire inserts instead of the foam strips that come

with the kit. The firm inserts do a better job of preventing the tires' tread and sidewalls from being distorted under heavy cornering loads. If it's any consolation, today's softer tires wear this way on the older chassis, too.



*Addresses are listed alphabetically in the Index of Manufacturers on page 273. ■

Highway patrol via radio control

This month, "Concours Corner" is devoted to what is without question the most menacing vehicle on America's highways. Lamborghini Diablo? Nope. Viper RT? 'Fraid not. Snarling monster truck? Tandem semi with bad brakes? Late-model Caddy with elderly driver asleep at the switch? None of the above. For sheer get-outta-the-way power, nothing tops a police cruiser. Sure, it's just a lowly Crown Vic or Chevy Caprice, but once that high-performance cop package is bolted in and a buzz-cut state trooper is installed behind the wheel, look out! Creating an R/C version of a modern black-and-white (which, more often than not, isn't black and white anymore!) isn't difficult, and the finished product is guaranteed to get a double take at the track—especially when you pull over that guy who hacks everybody.

CLASSIC COP CAPRICE

I quickly recognized Parma's* Chevy Caprice (part no. 10168) as a body ripe for "Concours Corner" treatment. Headlight, tail-light and grill decals print-

ed on high-quality stretchy vinyl are included, and an additional decal sheet (10792) with police/taxi emblems, badges and license plates is available from Parma. The Caprice shell has

been molded with a separate light bar for cop-car mode (more on that later), and if you want to go for a people-mover look, there's also a taxi-style roof light.

SCHEMING ON A SCHEME

The paint schemes and graphics on modern police cars have gone far beyond the traditional black-and-white with a badge on the door. Some cities have actually held contests to decide on the best paint jobs and graphics. Police forces across the country are trying to convey a more public-friendly image with sharp-looking cruisers, and my R/C version follows suit.

After the Lexan had it's usual bath to remove any mold release, dust and fingerprints, I masked the windows. Thankfully, Parma includes a set of window masks to help speed up the process. Be sure you line up the masks carefully with the preformed window outlines to avoid having to peel and reapply the masks, as they stick well.

The main color is white, which should have been applied last as it is the lightest color, but I bucked the system and



Parma's classy new Chevy Caprice makes a cool cop cruiser, and it can be used with touring-car and narrow pan-car chassis. The shell fits nicely on my HPI* RS4.



If you see this grill in your rearview mirror, you had better pull over! Ultra-thin pinstriping was used for the grill. The red bow tie was cut from vinyl, as was the trim on the front and rear bumpers.



To prevent darker colors from showing through the lighter areas, silver was used to back up the white before the

Metallic Blue was sprayed on. The accent lines that border the blue panels on both sides of the car are Pactra's pinstriping tape. This is a good way to hide any rough or uneven paint lines. Simulated bullet holes were added with a detailing pen—a bit of grim authenticity! The concours look was completed with RPM's white Invader rims (part no. 8084W).



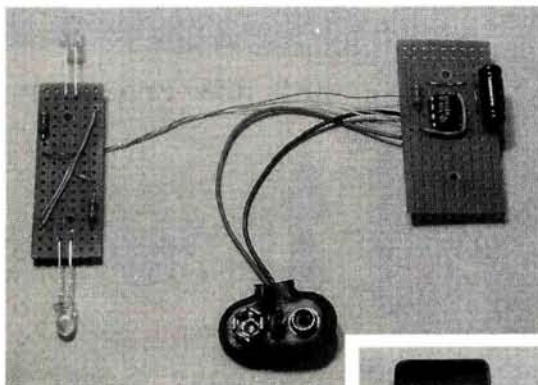
sprayed on Pactra's Sprint White first. To avoid the darker Metallic Blue from showing through the white, I backed the white with several coats of Indy Silver. Metallic Blue came next—four coats, with 15-minute intervals between applications. I finished with three coats of Indy Silver. The silver backs the semitransparent metal color and helps to bring out the "flake" in metal-flake.

Above: I created my own letter design called "Bullit Hole." The "Arvada" letters were cut with the STX-7 vinyl cutter. As you can see, the Stika cuts ultra-clean letters. Below: I painted the light bar with Pactra's Racing Red, Blue Streak and Outlaw Black. I covered the top with Coverite* Presto vinyl to hide the mounting holes. A section of chrome vinyl was applied to the front of the lights to simulate a PA speaker.



ANOTHER BRIGHT IDEA

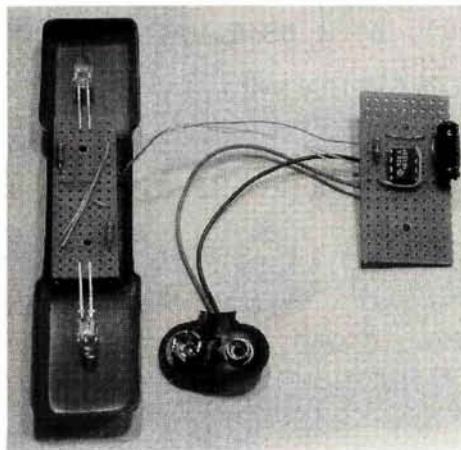
The highlight of this project is the light bar on the roof. This was the perfect place to inject real lights into the mix. Building and installing the board and components is very easy, especially if you're electronically inclined. Truthfully, if you built your R/C car from a kit and installed electronics, this job should be no sweat! To avoid having to drill holes for the LEDs, I mounted them on a board small enough to fit inside the Lexan light bar. I sprayed the light bar with three coats of paint. This gives a good, solid color yet allows the light to show through the paint. Red and blue LEDs are used, even though the light bar is painted the appropriate



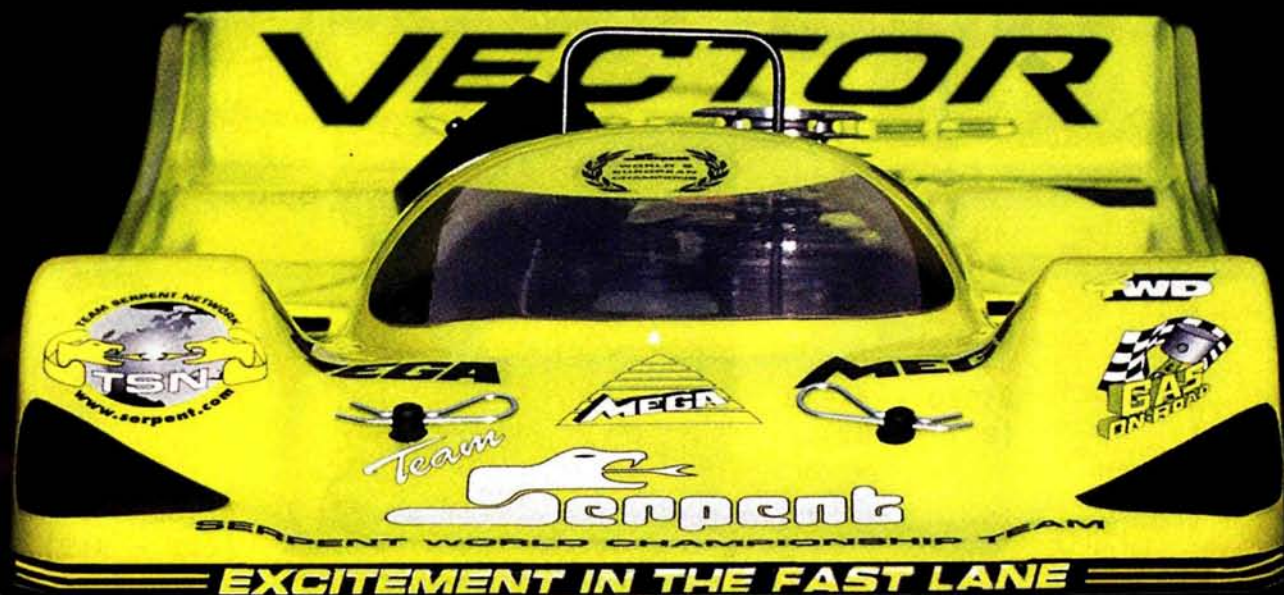
The 1x1 7/8-inch perforated ("perf") board can be cut into two sections for easy mounting. The smaller board is 3 1/4 x 1 7/8 in. This fits perfectly under the center section of the light bar. The larger board is mounted on the inside of the roof. The wiring between the two boards runs through a small hole in the roof.



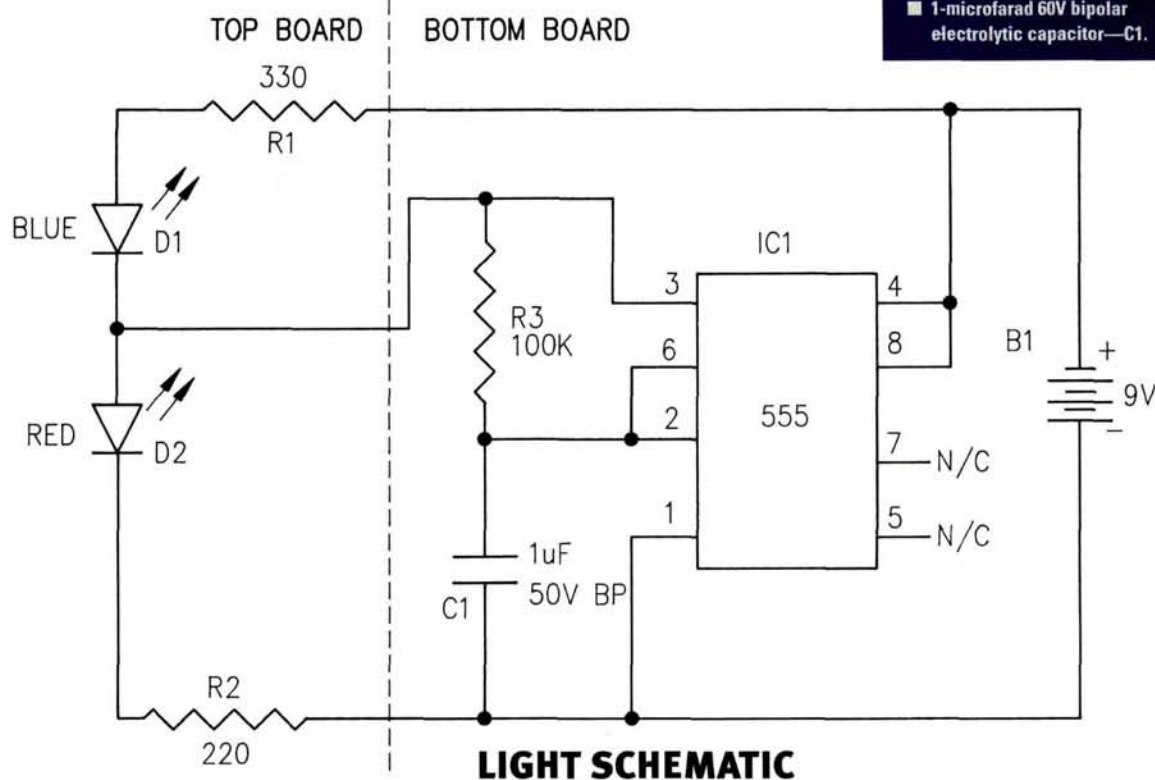
Above: hardware for the light bar extends through the roof and holds the larger board in place. The 9V battery is mounted with hook-and-loop strips for easy removal. Left: To avoid having to cut holes for the lights, the board on which the LEDs are mounted has been cut small enough to fit in the light bar. The light-bar mounting hardware has a dual purpose: it attaches the light bar to the body and holds the upper and lower boards in place.



PURE EXCITEMENT VECTOR Spec 99



Serpent USA, Inc. West Park Center 2832 NW 79th Ave. Miami, Florida 33122
Tel: (305) 639 9665 Fax: (305) 639 9658 E-mail: serp-usa@ix.netcom.com



PARTS LIST

- LEDs (blue/red)—part no. D1/D2.
- 1/8W Resistors (330/220/100K ohm)—R1/R2/R3.
- 1-microfarad 60V bipolar electrolytic capacitor—C1.
- 555 timer—IC1.
- 9V transistor battery—B1.
- Perforated board.
- Wire.
- Solder.
- Battery clip.

NOTES

- The values of R3 and C1 can be changed to alter the flash rate.
- Assemble components on perf board using point-to-point wiring. Be careful not to overheat IC1, D1, or D2.
- All parts should be available from your local RadioShack or electronics supply store.

color, and are bright enough to shine through the paint. A timer makes the lights flash in sequence. This whole light setup can be built for less than \$20 (see the parts list and schematic).

**Addresses are listed alphabetically in the Index of Manufacturers on page 273.*

PURE EXSITEMENT

www.serpent.com



Our totally new Team Serpent Network website is a lot like our Vector Spec 99 – fast, powerful, and loaded. Set-up a [customized home page](#) that presents the info *you* want (even the [language](#) you want it in, comprende?). See which friends are on-line and jump into a [chat](#) to discuss important topics like fuel consumption, tires and which race has the best track food. [Ask the Pros](#) technical questions, and the [racer forums](#) let everyone rant and rave.

Thinking of buying a Serpent? Check out the [Vector Spec 99](#) features that propel it from 0-60 in 1.5 seconds and send it down the straight at over 70. Read how it swept the Worlds in one of many [race reports](#). When you're ready to join the fun, you can even sell your old car in our marketplace and find a [Serpent shop](#) near you. Don't mention it ;-).

www.serpent.com - The coolest cars. The hottest site. Gentlemen, start your modems.

Tips, tips and more tips

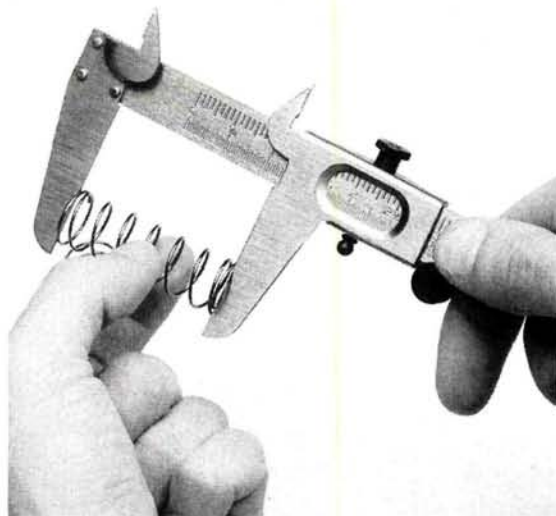
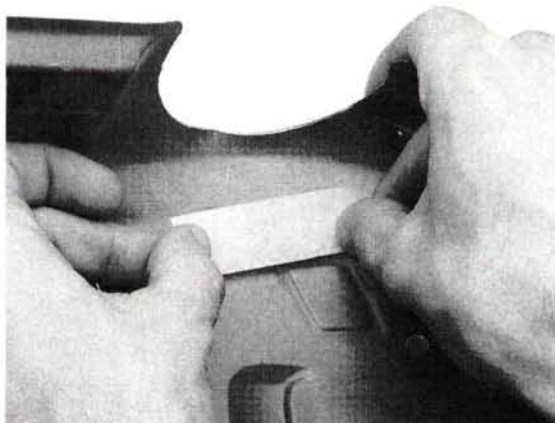
During my travels around the country, I make it my business to talk with R/C'ers because I want to know what's happening in this wonderful hobby of ours. From time to time, I hear some folk wisdom that makes R/C life easier, faster, or less expensive. When I run into one of these tips, I test it down in the secret underground laboratory to make sure that it really works. This month's suggestions have all made it through my exhaustive tests.

PROTECT THAT PAINT JOB!

Older shells frequently get tossed out because they're torn beyond use, but they're often discarded simply because paint has come off of the interior and that touch-up paint just doesn't match. At this point, most of us go to the hobby shop, pick up a new body, paint it, apply the decals, and start the whole process again. Too bad you can't make that nice paint job last longer

In fact, if you prep and protect the body's interior before it sees combat, you can make a nice paint job last almost indefinitely.

After I've finished a body, when I know it fits the wheel wells and body posts correctly, I go over inside areas with wide masking tape to protect the paint. I protect places where the battery might slide against the door panels, where the body posts and antenna tube pass through their holes, and especially up front, where the grill and front air dam may scrape the front bulkhead or shock tower. On sedan bodies, I even cover the inner sections of the fenders with thin masking tape. This prevents the tire treads from rubbing away the paint when the suspension is fully compressed.



PHOTOS BY WALTER SIDAIS

SPRUNG SPRINGS

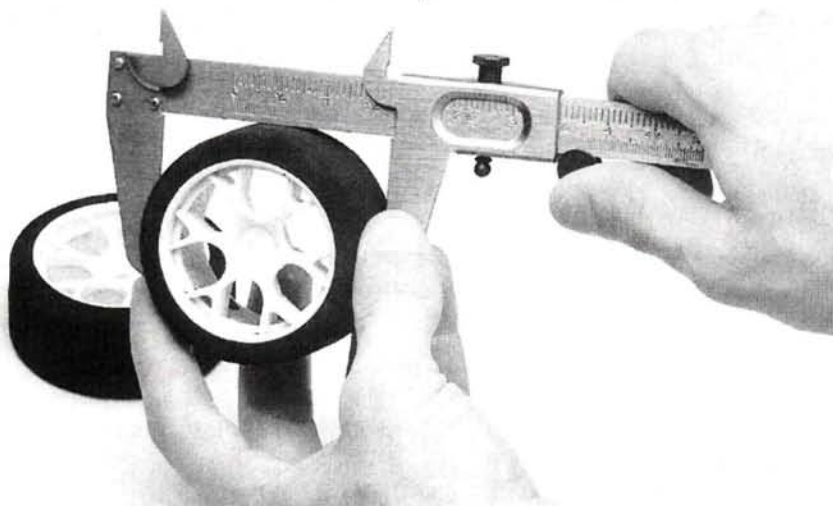
Regularly check the length of your shock springs. A spring that's just a smidgen shorter than the one on the other side of the chassis will make the car react differently to left- and right-hand turns, and at high speeds, the car may wander instead of tracking straight.

You can easily compensate for differences in spring lengths by adjusting spring preload when you install the springs on the shocks.

You should also check for tweak that may result from the shocks' being of different lengths. An inexpensive caliper is a wise addition to your tool kit and is just the thing for precise measuring tasks such as these.

HOW LARGE IS THAT TIRE?

Every heat or two, measure the diameters of the tires on your ride with a set of calipers. You may be surprised at how differently tires wear: tires on one side



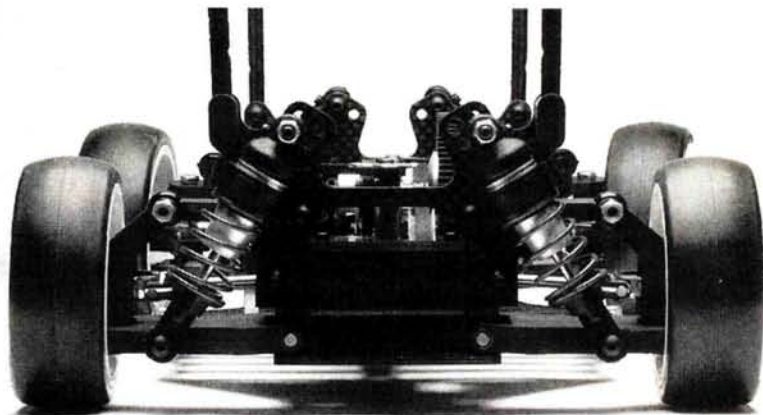
often wear more than those on the other side, or the fronts wear more than the rears (or vice versa). When that happens, a vehicle will probably turn more easily in one direction than in the other, or it may exhibit bizarre handling traits.

At a recent parking-lot race, after only two practice sessions, I discovered that the outside diameter of my left front tire was almost a full millimeter smaller than the one on the right side! I swapped them to even out the wear, but my lap times dropped by almost a full second! I was fighting the car all the way around the fast right-hander at the end of the straight.

Tire wear also affects gearing decisions: as the tire diameter decreases, a larger pinion must be used to maintain the same gearing rollout. Further, if your 4WD car's front wheels are smaller than the rear wheels and you don't have a one-way front diff installed, the front wheels will be overdriven. That means better handling through tight turns as the front wheels pull your car through but slower speeds on the straights. Knowledge is power!

HOW LOW SHOULD YOU GO?

Believe it or not, it really is possible to lower your chassis too far. You might bottom out the chassis, making the car difficult or uncomfortable to drive. I've seen sedan cars set so low that the shocks had only a millimeter or two of travel! That might work on a smooth carpeted track, but on the parking lot, it would spell disaster for most drivers.



Unless the track is very bumpy, this sedan could stand to be lowered by a few millimeters.

When your chassis rides less than 5mm off the surface, the shock springs will probably have a lot of preload. Although it doesn't make the shocks any stiffer, it does eliminate all of their down-travel, or "sag." The shocks can be compressed going over bumps but cannot extend going over dips.

If your car zigzags down the main straight and swaps ends if you as much as breathe on the steering wheel, your ride height might be too low. Set up your car with at least 5 to 7mm of clearance between the chassis and the surface. I think you'll find it easier to make consistent lap times, and you'll be much more comfortable with your car's handling.

FILAMENT FEVER

Do you use strapping tape to hold the batteries in your car? It's a time-tested method for cars that have battery slots, but it's difficult to find the end of the tape when you want to peel some off the roll (annoying, especially when you're setting up for your next heat).

Stick a piece of Lexan on the end of the tape to prevent it from folding over on itself or sticking to the tape on the roll. A small piece of Lexan left over from that new body does the job nicely because it's painted, so it will be easy to spot when you grab your tape. Just stick the Lexan piece on the end of the tape on the roll, and leave the sticky fingers and tape clumps to the uninitiated.

TAMIYA PLUG FIX-O-TRONIC

This tip comes directly from hotshot local racer (hey, he beat me!) Ricky Eickert, of Seattle, WA. Ricky runs in the highly competitive spec sedan class. One of his secrets is that he slips a pair of brass sleeves over the prong connectors on the male Tamiya plug (the plug on the speed control; not the one on the battery). Tamiya calls these parts "short flanged pipes" or "brass flanged tubes," and they're just like the ones you'll find on the TA02 chassis' upper shock mounts. The sleeves slightly compress the contacts' prongs and prevent them from spreading when the female connectors are inserted. You need only one pair because they stay with the plug on the car. Don't use the black ones because they don't conduct electricity very well.

Do you have any tips and tricks you'd like to share? I'm always looking for ways to make life at the track and on the bench easier! Drop me a line at R/C Doctor, c/o R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606.



*Rugged, Affordable
Beginner's Helicopter*



NORVEL

Powerful .06 cu. in. Norvel Vmax-6 helicopter engine has awesome power on economical 15% nitro fuel.



Compact 24 inch main rotor. Patented flexible plastic rotor blades fold up during crashes.

Kit prices start at \$199 including the new, patented dual-gain Arlton Gyro stabilizer. Complete combo packages with helicopter, engine, radio and accessories are available for less than \$500.

**ALITE
MACHINES**

1291 Cumberland Avenue
West Lafayette, IN 47906 USA
(765) 463-0959 Phone
(765) 463-7004 Fax

Call (765) 463-0959 for a free color brochure, or see a Model 110 at your local hobby shop.

new

SPECIAL EDITION "INSIDE SCOOP"

by the staff of *R/C Car Action*

Wouldn't it be great if you could see all the hottest new releases for the new year all in one day under one roof? That's what the National Model and Hobby Show in Chicago is all about, and that's why it is the most eagerly anticipated event of the year for any red-blooded R/C buff. Since most of you probably couldn't make it to Chi-town for the show, we bring you the next best thing—the hobby show in your hands that we call "New for '99"!

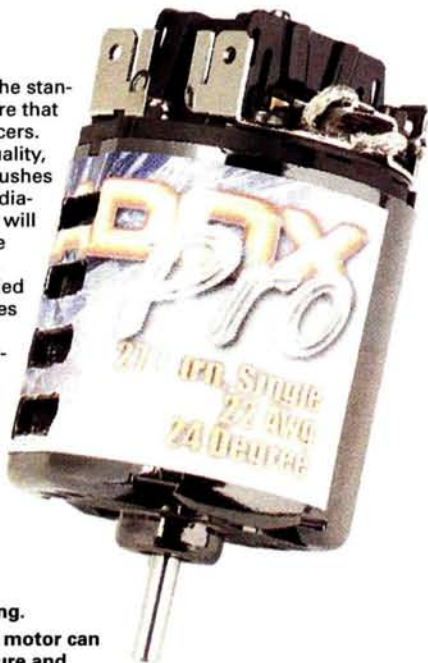
On the next 11 pages, you'll find all the cars, trucks, tools, parts and accessories you'll be lusting after for the next 12 months—including an extended look at Associated's show-stopper, the TC3 touring car. Enjoy.

Trinity Paradox Pro motor

This has all the features of the standard Paradox and a few more that will appeal to stock-class racers. The Pro will include high-quality, hard-compound serrated brushes with soldered shunts and a diamond-trued armature. Each will be tested on a dyno, and the dyno sheet will be included. The Chameleon spec modified motor, which has the features of the Paradox stock motor, is also available in a Pro version. Look for:

- Removable endbell.
- Locked commutator.
- Extended motor shaft with tapered end.
- Hard-compound serrated brushes.
- Soldered brush shunts.
- Tagged armature.
- Tamper-proof endbell timing.
- Large holes in endbell and motor can to allow viewing of armature and commutator.

Call for info.



Pro-Line LP sedan slicks and Road Rage tires

After months of testing and development, Pro-Line's low-profile touring-car versions of the company's national-championship-winning sedan slicks are at last available. They improve handling because there's less sidewall flexing and they lower ride height. The Road Rage low-profile sedan tires feature an aggressive tread pattern for bumpy and dusty parking lots, and both tire types fit all standard-width touring-car wheels, include foam inserts and are available in Pro-Line's soft S2 and softer S3 compounds.

Part nos. 1092S2, 1092S3 (LP sedan slicks), 1093S2, 1093S3 (LP Road Rage tires).

\$12.50.



Tamiya clear CVA Mini shocks

Tired of basic black? Tamiya's clear CVA Mini and Super-mini shocks dress up your car and make it easy to spot air bubbles. The Super-minis are for the TA03R-S and TA03F chassis, while the Minis will fit a wider range of Tamiya vehicles (a handy chart tells which of the included spacers to use to achieve the correct shock length for your vehicle).

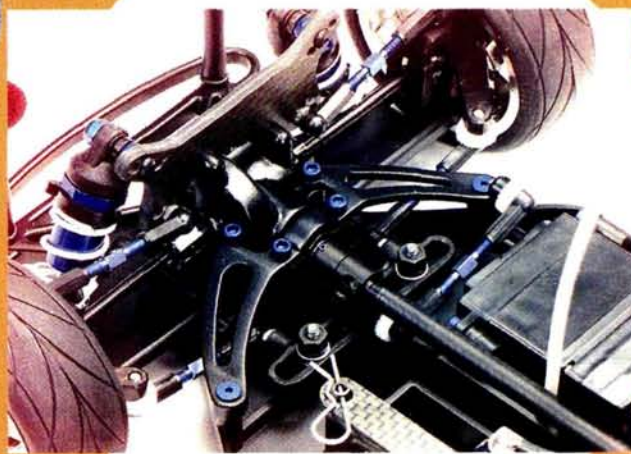
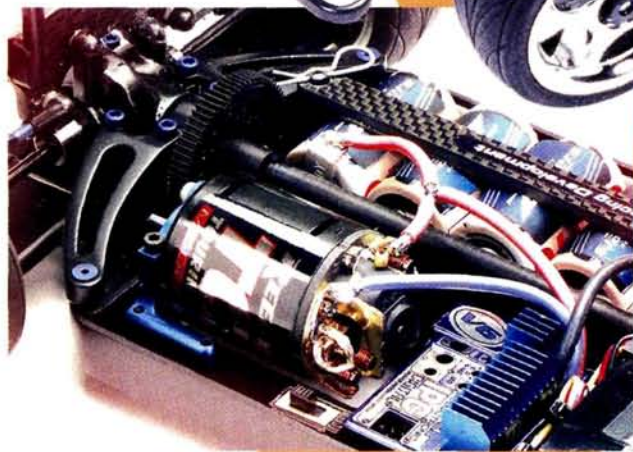
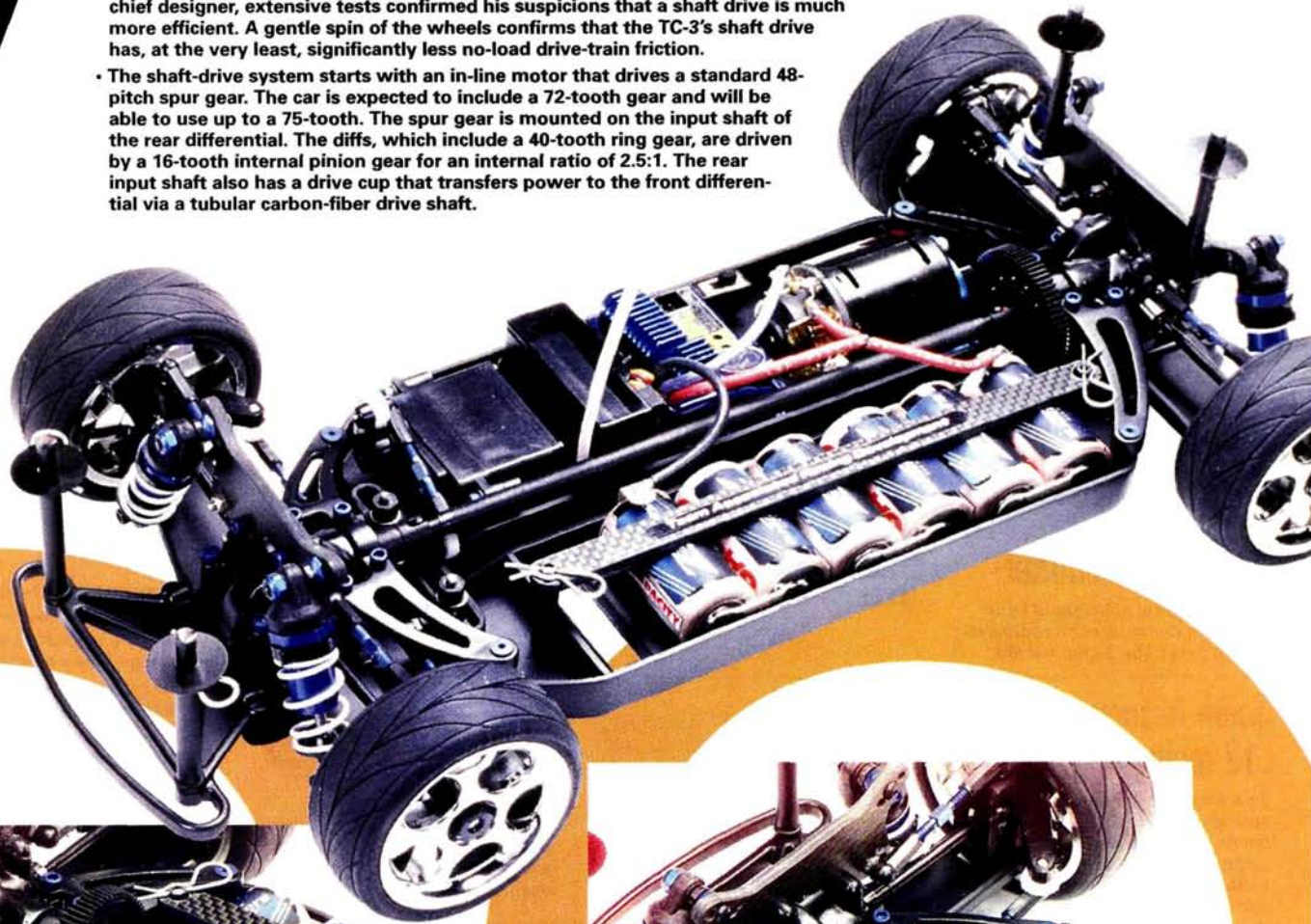
Part nos. 49088 (Super-mini), 49087 (Mini).

\$18.

Associated TC3 touring car

The NMH show gave us a look at what has to be the most anticipated new product in recent years: the Associated TC-3 touring car. Though the car featured here is a prototype, it tells us what to expect in a few months when it's likely the TC-3 will be available.

- The TC3 breaks the boundaries of convention with a shaft-drive system; most currently available competition-class touring cars utilize a belt-drive system. According to Cliff Lett, Associated's chief designer, extensive tests confirmed his suspicions that a shaft drive is much more efficient. A gentle spin of the wheels confirms that the TC-3's shaft drive has, at the very least, significantly less no-load drive-train friction.
- The shaft-drive system starts with an in-line motor that drives a standard 48-pitch spur gear. The car is expected to include a 72-tooth gear and will be able to use up to a 75-tooth. The spur gear is mounted on the input shaft of the rear differential. The diffs, which include a 40-tooth ring gear, are driven by a 16-tooth internal pinion gear for an internal ratio of 2.5:1. The rear input shaft also has a drive cup that transfers power to the front differential via a tubular carbon-fiber drive shaft.



- Both of the ball diffs are in sealed housings designed to reduce the need for maintenance by preventing debris from fouling the diffs. Precision-molded, lightweight composite bevel gears will be used on the production car to transfer power from the drive shaft to the diffs.
- Standard MIP CVD drive shafts transfer power from the diffs to the wheels. The TC3 will accept standard touring-car wheels.
- The chassis will be a molded composite tub. The motor is mounted in line with its shaft facing the rear, and the speed control, receiver and steering servo are mounted just ahead of the motor to keep all of the electronics on one side of the chassis.
- The chassis is designed to accept stick packs and 6-cell packs assembled side by side; this makes the competition-class TC-3 versatile and user-friendly. A hold-down strap allows easy installation and removal of the battery. With a transponder in place, the side-to-side weight distribution is reported to be exactly 50:50—ideal for balanced handling.
- Instead of a traditional bellcrank system, the TC-3's steering system features a rack-type steering assembly designed to maintain

the proper Ackerman angle at all times. This should make handling more consistent, allow the car to carry more speed through the corners and help reduce tire wear. The steering rack will feature a built-in servo-saver.

- Conventional lower A-arms and adjustable upper links suspend the car. Damping is handled by VCS (volume-compensation system) Macro shocks, first seen on the RC10L30 oval car.
- One of the TC-3's strong points is that many of its parts are universal. For example, the suspension arms are the same from one side of the car to the other. You'll only have to carry one front suspension arm and one rear arm in your parts box because they will fit on either side of the car. Likewise, the front and rear transmission housing/bulkheads are interchangeable.

The TC-3 is expected to be released in two versions—the TC-3 Sport and the TC-3 Team Edition. Both are expected to include a chassis molded of a similar material to that used for the Associated T3 and B3.

Part no. 3010 (Sport touring car), 3030 (team touring car).
Call for price.

new
for '99



Hitec RCD Lynx 3D transmitter

Hitec's eagerly anticipated Lynx 3D computer-controlled radio system is here! The 3-channel FM

transmitter is very easy to master and is competitively priced to appeal to newer racers and experienced drivers alike. Here's a quick look at a few of the radio's hot features.

- 10-model memory.
- Large LCD display.
- High-quality dual-conversion 3-channel receiver.
- Ni-Cd transmitter batteries and charger included.
- Dual-rate steering.
- Anti-lock brakes.
- Throttle and steering exponential.
- Digital trims.
- Idle-up feature.
- Direct servo control (DSC).
- Removable module.
- Left- and right-hand operation.
- Built-in timer with up or down countdown.

\$229.

Team Associated .12 racing engine

This engine will be built with racing in mind. The traditional vertical-fin heat-sink head is said to improve cooling, and a true, side-exhaust port should improve exhaust flow. The engine is still in the prototype phase, but it will probably offer the choice of a slide or rotary carb. Also has:

- Competition porting.
 - Centered side-exhaust port.
 - Available with slide or rotary carb.
 - Also available in non-pull-start.
- Call for info.



HPI Racing RS4 Pro 2

The Pro 2 is essentially the same car as HPI campaigned at the IFMAR On-Road Worlds, but its many new features make it even more formidable. Check out the:

- Lighter, stronger upper and lower graphite chassis plates.

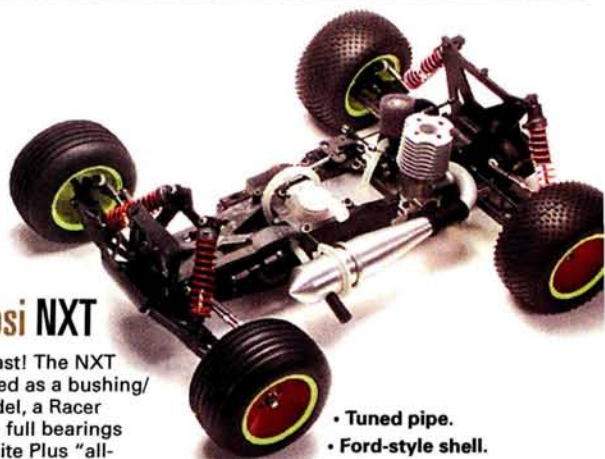


- Stiffer suspension components.
 - More efficient drive belts.
 - Molded graphite shock towers.
 - Purple-anodized aluminum MIP CVDs, shocks, motor mount, tie rods and suspension-arm braces.
- ... and a whole lot more!
Call for info.

Team Losi NXT

It's here at last! The NXT will be offered as a bushing/bearing model, a Racer version with full bearings and a Graphite Plus "all-the-hop-ups" kit. Look for a "Thrash Test" soon! The NTX includes:

- Revised suspension geometry with new shock towers.
- Heavy-duty, dual-pad slipper clutch.



- Tuned pipe.
- Ford-style shell.
- Receiver cover.

... and more.

Part nos. A-0810 (NXT gas truck), A-0820 (NXT Racer kit), A-0830 (NXT Graphite Plus).

\$314.95, \$439.95, \$499.95.

Team Orion DC67 Pro Digital Charger



- Charges 6- and 7-cell packs.
- LCD read-out displays constant current, capacity, voltage, charge time and charge rate.
- User-selectable temperature or delta-type peak detection.
- Protected against reverse polarity and overload.

Part no. AT3310.

\$300.

Orion's best battery-filler-upper is predictably packed with features and is compact enough to stow easily. Here's what you get:

Reedy Motors Rage Type-R motor

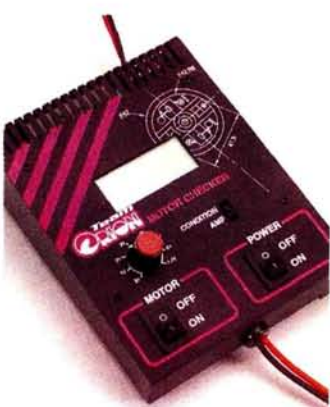


Here it is—Reedy's rebuildable stock-class motor built to ROAR specifications. Production versions will reportedly include an extended motor shaft with a tapered end that will simplify technical inspection.

Look for:

- New motor-can design with side and bottom cooling vents.
- Tagged armature.
- Endbell can only provide 24 degrees of timing—no cheating.
- Laydown-style brushes.
- New medium-diameter commutator.
- Large opening in endbell and motor allows armature and commutator to be checked.

Call for info.



Team Orion Motor Checker

Don't know when to rebuild? The motor checker will analyze current draw and commutator condition to determine whether your car's electric powerplant is race-ready. LCD display shows motor condition as a rating from 1 (worst) to 10 (best). Voltage-adjustment knob allows motor to be tested at various rpm.

Part no. AT3200.

\$175.

new
for '99



Thunder Tiger EB4-03 1/8 off-road buggy prototype

The EB4-03 (probable name on release) was designed for world-class competition. It features some of the latest advances in 1/8 buggy tech, and it's expected to be released in time for spring racing.

- 3mm chassis plate with front kick-up.
- Aluminum diff housings.
- Metal disk brakes.
- Adjustable wheelbase, caster and front track.

- Rear anti-dive suspension geometry and adjustable toe-in plates.

Part no. 6201.

Call for price.



Hitec RCD Fastrack Sport Pack

Want to get into electric R/C racing? The Fastrack Sport Pack includes everything you need to complete most electric R/C car kits:

- Lynx AM radio.
- HS-303 servo.
- 520 reversing ESC.
- CG-315 peak charger.
- 1600mAh stick-pack battery.
- 20-turn motor.
- Also available: Stock Pack (w/2 servos, but no motor or ESC) and Energy pack (charger, motor, battery).

\$139.95 (Sport Pack), \$119 (Stock Pack), \$59 (Energy Pack).



Pro-Line Road Rage buggy tires

These 2.2 inch off-road buggy tires are perfect for on-road racing—asphalt, concrete, etc.—but will also work well on loamy and tightly packed off-road surfaces. They have an aggressive directional tread pattern, are molded from a soft rubber compound and include foam inserts. The rears will fit most stock 2.2-inch rear buggy wheels, but Pro-Line's 2.2-inch-wide buggy front wheels are needed for the wide Road Rage fronts.

Part nos. 1101 (fronts), 1102 (rears).

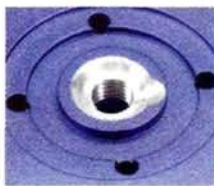
\$12.50.

FSR Ported head for FSR and Thunder Tiger .12 engines



This ported head is relieved around the glow-plug opening to help direct exhaust gases out of the combustion chamber. It simply replaces the stock piece; install it so the port faces the exhaust opening. Large cooling fins and a blue/polished finish make it efficient and good-looking, too.

Call for info.



Team Orion Pilot modified motors

Give your car or truck maximum horsepower for minimum dollars with these mod motors. All Pilot mods are equipped with fixed endbells and bushings and are available in 11-, 13-, 15-, 23-, and 27-double winds.

Part nos. TM81102 to TM82702.
\$20.



DuraTrax Maximum ST nitro truck

The first complete vehicle to bear the DuraTrax name. Assembled and ready to run; includes a painted, trimmed body; factory-installed engine and radio gear (right down to the AA batteries!). Also available minus radio system. The truck doesn't skimp on features; here's a sampling:

- 85cc fuel tank.
 - Ball-bearing transmission with slipper clutch.
 - Turnbuckle camber links.
 - 2.2-in. truck wheels with monster tires.
 - Aluminum-pan chassis.
 - TORQ .12 pull-start engine.
 - Instructional video.
- Call for info.



Competition Electronics Turbo 35 charger

The "Turbo" line has always been full of cutting-edge functions and features, and the new Turbo 35 is no different. In addition to a bold new look and easier-to-use software, the 35 offers:

- Discharge rates up to 35 amps.
- Variable-discharge mode to condition cells to your type of racing.
- Stores up to three setups; saves setup from last time machine was switched on.
- Displays actual internal resistance of cells.
- Motor-run feature powers lathes, tests motors, etc.
- Turboflex charging lowers impedance and conditions cells
- Computer serial interface port. ... and that's just the shortlist!

Part no. CEI-3700.

\$569.95.

Associated RC10L3 Sport Touring and Team touring car

The ST is based on the same design as the new RC10L3. Its width and wheelbase have been modified to allow it to fit under a standard 190mm touring-car body. This will be an inexpensive alternative touring car with comparable performance on smooth, high-traction surfaces. It has:

- VCS shocks.
- Aluminum hubs.
- Graphite rear axle.
- Ball differential.
- Graphite chassis.
- Dynamic-strut front suspension.
- Pro-Line/Jaco tires.



Part no. 8030 (Sport), 8035 (Team).

Price of 8030 to be announced, \$285 (Team).

new
for '99

JR Racing XR3 FM radio

Hey, isn't that the XR2? Look closely; that's JR's new XR3 with three channels, 3-model memory and (yes!) FM operation. Available in 27 and 75MHz versions. Also has:

- LCD display.
- Direct Access Digital Trims (touch the trim button, and the trim value pops up on the LCD screen. Cool.).
- Trim memory.
- Adjustable steering balance.
- Adjustable steering and throttle end point adjustment.

Part nos. JRP314127 (27MHz), JRRP314175 (75MHz).
\$209.95.



Pro-Line Traxxas Stampede and Rustler Ford F-150 monster truck bodies

Traxxas Stampede and Rustler owners rejoice! These Ford F-150 truck bodies were designed to be bolted right onto the popular Traxxas trucks. The Ford's sleek styling and aggressive lines will give your truck the concours touch you were searching for. The Rustler version is a functional racing body that should lower your lap times while looking good. The Stampede version can be mounted high to give your monster truck true skyscraper status. Both bodies include decals and window masks that make painting and detailing a snap.

Part nos.—3083 (for Stampede), 3084 (for Rustler).
\$21.95, \$21.95

HPI Racing Nitro RS4 RTR

How can you possibly make a popular car like the Nitro RS4 even better? Make it ready to run (RTR), with a proven Airtronics Rival 2P radio system and heavy-duty throttle and steering servos—that's how! Perfect for first-time hobbyists and racers who don't want to spend hours building a kit. Like the Nitro RS4 kit, the RTR can be upgraded with HPI's easy-to-find hop-up parts.

- Full ball bearings.
- Purple-anodized and countersunk chassis.
- New .15-size Nitro Star engine with tuned pipe and header.
- Choice of cool-looking Ford F-150 Flareside body with huge rear wing or exotic Skyline R34 25GT body.

Part nos. 571 (w/Ford F-150 Flareside), 572 (w/Skyline R34 25GT).



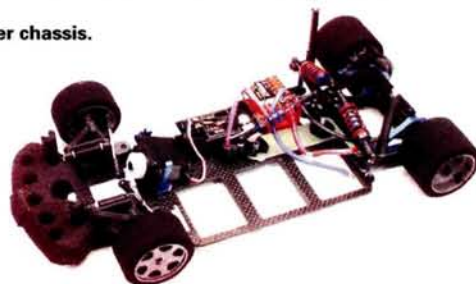
Associated RC12L3 Oval

The 12L30 is based on the same design as the recently released 12L3, but has been modified to make it more suitable for flat and banked-oval tracks. The left side of the chassis has been cut to accept up to six cells; the weight of the batteries may be repositioned for proper weight bias.

Look for:

- Lightweight carbon-fiber chassis.
- VCS Micro shocks.
- Dynamic-strut front suspension.
- New three-lug aluminum-hub design.
- Graphite rear axle.
- Ball differential.

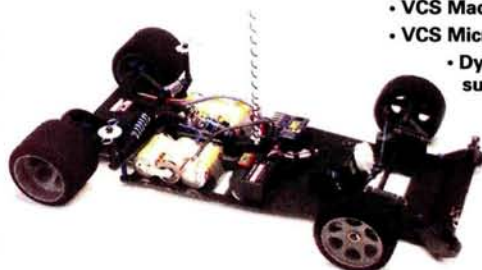
Part no. 4016.
\$265.



Associated RC10L3 On-Road

The new 10L3 uses much of the same technology as the newly released 10L30 oval car. It features a revised rear suspension using the new Associated VCS shocks. A VCS Macro shock handles the up and down damping, while VCS Micro shocks handle side-to-side damping.

- New rear suspension.
 - VCS Macro main shock.
 - VCS Micro side shocks.
 - Dynamic-strut front suspension.
 - Aluminum hubs.
 - Graphite rear axle.
 - Ball differential.
 - Jaco foam tires.
- Part no. 8017.
\$285.



Hammad Ghuman VLT shocks

These VLT (very low turbulence) shocks are machined from solid, clear, Lexan, so you can see inside to identify piston type, inspect the condition of the oil and check for air bubbles. Oh yeah, they look trick, too!

Part nos. 5300 (RS4 Pro/Nitro), 5305 (RS4 MT front), 5306 (RS4 MT rear).
Losi and Associated N/A.
\$12.95/pair.



FSR Aluminum bulkheads for Bullet

These beautifully machined bulkheads and suspension arms will strengthen the Bullet's already potent chassis, and have the same unique features as the plastic parts they replace. A swaybar is built into the rear system.

Call for info.



new
for '99



OFNA Nitro Mini Colt 4WD

This Mini stands out with its red-anodized chassis and molded red shocks and bumper. Check the specs:

- Dual ball diffs.
- 3-belt drive system.

- Fiberglass disk brake.
 - Colt .12 engine with pull-start.
 - Assembled chassis.
 - New Beetle body.
- Call for info.



Team Orion Modified motor lathe

Team Orion's newest comm lathe ensures a perfect cut every time with its special features:

- No shims; nylon thumbscrew quickly takes up any shaft play.
 - Pinned construction guarantees an absolutely "true" cut.
 - U-groove for armature shaft prevents the arm from "climbing out" while cutting; an oil reservoir beneath the U-groove lubes the arm.
 - Push on/push off switch is conveniently located for ease of operation.
- Call for info.



JR Racing R330S PCM micro receiver

The JR engineers were thinking small when they created this. What makes it special? It's PCM, and everybody knows pulse-code modulation is tops in interference rejection. Pair the R330S with JR's R-1 radio, and you have a potent package for glitch-free, high-performance R/C.

Part no. JRPR330.
\$129.95.



Robinson Racing Products Black Absolute spur gears and Stealth upgrades

RRP's lightweight, one-piece top shaft for Associated Stealth trans has less rotating mass and is stronger and more precise than the stock parts. For the ultimate in smooth, use the top shaft with RRP's new, machined idler gear. New, Black Absolute spur gears in 64 pitch are extra tough, smooth, and quiet. Great for touring cars!

Call for info.



MONSTER STOCK JR 4 Pro

36° Stock, 27 Turns, 22 Awg.
6.0 Wet Magnets, LCG™ Flat Motor Can
RC4499 "E" Brushes, Tweaked Springs
Dyno Tuned, Capacitor Installed
In Motor Tube With Dyno Print Out
Very Fast.....And Very Scary!

RC2103



SPEED COUNTS
TRINITY

www.teamtrinity.com

PARENTAL
ADVISORY
EXPLICIT
CONTENT

MEETS ALL
SPECS
NORRCA

**new
for '99**



Tekin G10 Pro

So what's the "Pro" all about? All your favorite features from the original are there, but now the "on" resistance is lower—just 0.0004 ohm, thanks to new V-Fet technology. The G-10 Pro can also talk to your PC via its data tuning port, and it's lighter than the original. More trick features may be added as

Tekin gets the G10 Pro ready for the world. We'll keep you informed!

Part no. 1422.



Indl/Eagle Nuclear 7 power supply

No, this is not an electric shaver; it's a power supply. Just plug it into a wall socket and hook up your DC-powered charger to the universal jack. The unit has a built-in fan and produces 7 amps of power—enough for just about any DC-only charger. Two units can be bridged together to provide 14 amps of continuous power. Its best feature, however, is its low retail price. Distributed by Integy.

\$39.95.

Serpent Impulse 10 touring car

If this performs as well as Serpent's other 1/10 and 1/8 on-road racers, it will definitely be a success. Features include:

- Mega .12 engine.
- 4WD with single-speed tranny.
- Externally adjustable, composite shocks.
- Dual belt drive.
- Precision planetary gear diffs with dogbone drive axles.

Call for info.



MRC Q-Tee Coupe

It might look like a dedicated on-roader, but beneath that vintage body shell lies a very capable off-road chassis—complete with 2-belt 4WD drive train! Other features that make the Q-Tee fast and fun include:

- 20-turn stock motor.
- Fiberglass chassis.
- Long-travel composite shocks.
- Extra-wide street-tread radial tires and chrome wheels.
- Cast-aluminum motor plate.

Call for info.



TRC TEAM LOSI STREET WEAPON Touring Foams

DO YOU RACE YOUR TOURING CAR ON CARPET. OR ARE YOU JUST TIRED OF THE NEW RUBBER TIRE OF THE WEEK GAME?



STANDARD FOAM

TT1141	Green Mounted and Trued	\$14.99
TT1142	Blue Mounted and Trued	\$14.99
TT1143	Double Blue Mounted and Trued	\$14.99

EXOTIC NATURAL RUBBER

TT1150	White Mounted and Trued	\$17.99
TT1151	Gray Mounted and Trued	\$17.99
TT1152	Platinum Mounted and Trued	\$20.99
TT1153	Pink Mounted and Trued	\$20.99
TT1154	Purple Mounted and Trued	\$20.99
TT1155	Red Mounted and Trued	\$20.99

All tires come in pairs and are on Street Weapon rims

36 Meridian Road
Edison, NJ 08820
Ph: 732-635-1600
Fx: 732-635-1640

Standard Models Available
To Fit HPI, Tamiya, Kyosho
Yokomo, Schumacher Etc.

new
for '99



Team Losi Street Weapon IWTG Edition

This is the "Graphite-Plus" version of Team Losi's sedan. It includes high-performance parts that have been developed over the last two years, and it's almost identical to the factory team Street Weapons that dominated the touring-car class at the most recent 1/10 On-Road World Championships.

- Molded-graphite suspension components and LCG chassis.
- Low-CG motor mount.
- Threaded-aluminum shock bodies.
- New zero-degree front bulkhead.
- New front hub carriers.
- Team Losi Dodge Stratus body.
- Titanium turnbuckles.
- Modified blue touring-car rear belt.
- Titanium-nitride shock shafts.
- Aluminum rear drive shafts.
- Front and rear swaybars.

Call for info.

CEN Super GX1 electric- and nitro-powered touring cars

CEN's top-of-the-line tourers use a belt-drive system to couple sealed front and rear gearboxes in a mid-motor layout. "Super" features include:

- Full bearings.
- Countersunk, anodized Alumi chassis (nitro Super GX1).
- Carbon-fiber chassis (electric Super GX1).
- Universal drive shafts.
- Turnbuckle camber links.
- One-way front differential.
- Available with various touring GT1 and GT2 body sets.

Call for info.



Holeshot Millenium scale

If you demand total precision in your racecar setup, this digital scale is for you. Each wheel sits on its own scale, which clearly indicates weight on a digital LCD display. Battery operated and portable, the scale can be used with all 1/10, 1/12 and 1/8 cars, trucks and buggies.

Part no. 2500.

\$439.95.

Serpent Tire Truers

Precision tire truers make it easy to cut your tire onto the truer, manually set the depth of the



cutting blade and make the pass. The Automatic Pro version makes the cut itself, smoothly and precisely. Adapters are available for all types of on-road tires.

Part nos. 102002 (Automatic Pro), 102501 (Manual).

\$479.95, \$249.95.



Pro-Line Ford F-150 street truck touring-car body

Looking to give your 190mm touring-car chassis a different look? Take a gander at this faithful reproduction of a custom street truck that you would see cruising around the boulevards or motor-ing along a California freeway. As you can see, the body has a cap over the bed—very cool!

Part no. 3085.

\$21.95.



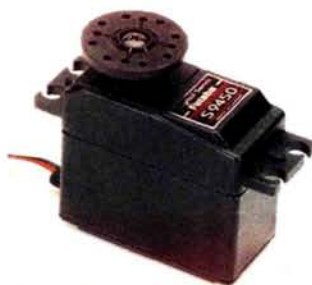
Tamiya Baja Champ

Here's an affordable 4WD off-road buggy that's based on Tamiya's new TA-01B chassis. It features:

- Long suspension arms and shocks.
- Large front bumper.
- Single-seat buggy body with large rear wing.
- White star-dish wheels with spiked tires.

Part no. 58221.

\$132.



Futaba 9450 digital servo

This is the first in Futaba's line of powerful car servos to offer the digital signal processing that almost halves response time. The S9450 has virtually identical specifications to the S9402, with the addition of digital capability. Other features are:

- 111.1 oz.-in. torque.
- Transit time of 0.10 second.
- Weighs 1.9 ounces.
- Measures 0.79x1.59x1.40 inches.

Call for price.

BSR Foam tires

The NAS 2001 wheel and 2001 foam offer super performance for oval and on-road drivers. The foam is glued around the rim so that the seam runs across the tread—no more center seam to split! Many compounds of foam and cap tires are available—too many to list here!

Check with your BSR dealer for info.



Fioroni Hop-Ups

Distributed in the U.S. by Ace Hobbies, Fioroni performance accessories are the choice of many of the world's top 1/8 buggy drivers. Many of the aluminum accessories are made of 7075 aluminum, which is much more rigid and more resistant to bending than the standard 6061 material used by other companies.

Options include:

- 4- and 6-gear Thorsen differentials.
- Aluminum front steering hubs and hub carriers.
- Adjustable-rear-toe pivot block.



- Aluminum torque rods.
- Lightweight flywheels
- Hard-chrome-plated clutch bells and spur gears.
- Heavy-duty aluminum chassis and shock towers.
- Aluminum suspension arms.

Call for info.

Novak Millennium

This much-anticipated charger is jam-packed with hot racing features:

- Full-feature DC battery-management system.
- Detailed charge information and analysis.
- Microprocessor-controlled.
- Large backlit LCD screen for optimal viewing.
- Tri-mode operation: linear, reverse-pulse, Ni-MH.
- Motor break-in function.
- Fully protected.
- 0.5- to 7A adjustable charge rate.
- Internal heat sink and cooling fan.
- Small footprint (4 x 4.375 x 2.25 inches).

Part no. 4480.

\$249.



Yokomo M2 and M3 machine-wound motors

Yokomo's Zero line of machine-wound modified motors was one of the Orient's best-kept secrets, but now that the budget motors have hit our shores, racers have discovered the performance advantages they provide. Yokomo has stepped up its production with these Super Touring motors. They feature three commutator diameters (8, 9 and 10mm), so racers can choose the one that best fits their racing application. The 9mm commutator is sized between a typical large commutator and a small one, so it will provide the benefits of high torque and high rpm in one package. Available in 10- to 13-turn double or triple winds.

\$49.95.

new
for '99



HPI Racing Super Nitro RS4

"Big," "bad" and "fast" are the words that describe the "supersize" Super Nitro RS4, but there's a lot more to it. It has a much wider stance so is much more stable than a typical 1/10-scale touring car. It's about the same size as the Tamiya TGX and Kyosho Super Ten, and because its wheelbase can be adjusted, Kyosho and Tamiya bodies may be bolted right on. You can choose either a sleek, low, Ford F-150 truck body or a highly detailed Viper GTS-R shell, so it's unlikely you'll be shopping for a body any time soon. Scope out some of the car's features.

- Heavy-duty purple-anodized and countersunk chassis.
- .15-size Nitro Star engine.
- Large front bumper.
- Highly efficient, triple-belt drive train.
- Easy-to-remove radio tray.

- Full ball bearings.
 - Three belt tensioners (one for each belt).
 - Double-wishbone suspension with adjustable upper arms.
- Part no. 482 (w/Ford F-150), 481 (w/Viper GTS-R).

Tamiya TA03R-TRF Special chassis kit

Here's a totally hopped-up version of Tamiya's TA03R, and it's ready to swap paint with the best of them. The car includes 27 Tamiya hop-ups, including:

- Graphite double-deck chassis.
- Front one-way diff.
- Rear ball diff.
- Hollow carbon gear shafts.
- Aluminum rear uprights.
- Aluminum 15-tooth pulleys.
- Type-A-compound reinforced slicks.
- Sealed ball bearings.
- Carbon steering connector.
- Front and rear sway-bars, special black molded parts.
- ... and much more.

Part no. 58227.

\$498.

Parma Faskolor

Parma brings new convenience and safety to R/C-car-body finishing with Faskolor water-based paint for Lexan. It's available in a range of 16 "standard," pearl and fluorescent colors. We mangled some slot-car bodies that Parma had painted with the stuff, and we couldn't get the color to chip or crack! Look for 2-ounce bottles of Faskolor at hobby stores soon.

Call for info.



Bolink 1/10-scale '99 Ford Taurus superspeedway body

Bolink was the first to produce a 1/10-scale '99 Ford Taurus NASCAR body, and as you can see by the photo, this thing is sweet. Molded of 100-percent GE Lexan, the Taurus will fit most narrow superspeedway cars. Two versions: standard and Pro Lite.

Part no. BL2255 (Pro Lite), BL2245L (standard).

\$19.95.



Indi/Eagle 16x2, 16x2-Pro, 16x2-Nitro and Pocket quick chargers

Indy's feature-packed line of peak chargers meets the needs of all R/C car hobbyists. The 16x2 and 16x2-Pro are AC/DC-powered and feature three charge modes and a built-in fan. The 16x2-Pro has an LCD display that gives vital battery-charging/discharging information. The 16x2-Nitro is for nitro-powered vehicles and has a built-in glow-plug igniter charger as well as an output plug to charge receiver batteries. Finally, the Eagle Pocket Quick Charger is a DC-powered peak charger that can charge 6- and 7-cell battery packs and receiver battery packs. Distributed by Integy.

Call for info.

new
for '99



LRP Quadra charger/discharger

The Quadra will juice up and cycle all your R/C Ni-Cds, including transmitter and receiver packs. A multifunction meter indicates the input-voltage level, output-voltage level, battery-charge status (0 to 100-percent charged) and peak voltage. Other features include:

- Built-in cooling fan.
- Cycles packs once ("Refresh one") or three times ("Refresh 2") with LED charge/discharge indicators.
- Overload and reverse-polarity protected.
- User-selectable charge current, 0.5 amp to 5.5 amps.
- Fixed 4A discharge rate.
- Simultaneously charges 6- to 8-cell pack, receiver pack and transmitter pack.

Call for info.

Novak Sport ESCs

Novak's newest ESCs include "trickle down" features from the high-zoot Cyclone and Atom, as well as some tricks all their own; all feature:

- 6- and 7-cell operation.
- One-Touch Set-Up™.
- Factory installed battery and motor connectors.
- Thermal-overload protection.
- Polar Drive technology.

EXPLORER II

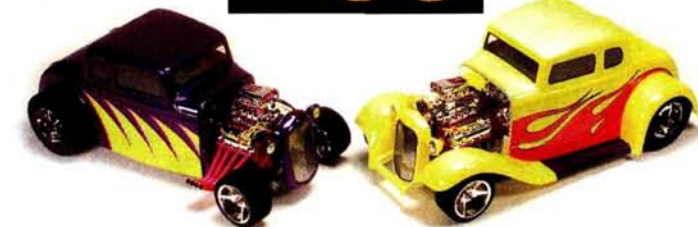
- Reverse-voltage protection.
- Built-in Schottky diode.
- Brake-light circuitry
- 15-turn motor limit

Part no. 1910.

\$88.

FUSION DUAL-PROFILE ESC

- Two user-selectable profiles—one for stock racing and the other for mod.
- HYPERFET III transistors.
- 240 amps of rated current.



Parma Hemi Coupe 2

This updated, more scale version of the classic Hemi Coupe includes:

- Parma's super-scale Hemi engine with wiring kit.
- Full fenders (kit may be built

with or without them).

- Vinyl window masks (simplify painting).
- New grille and headlights with chrome decals.

Part no. 15040.

\$129.95

Niftech Motor-spring bending tool

For the ultimate in motor-tuning accuracy, Niftech's tool is a must-have. It allows you to increase or decrease brush-spring tension with repeatable results. Use the tool to balance brush pressure to reduce comm friction, making your motor run cooler and produce more power and rpm while extending battery life. Try Niftech stainless-steel motor springs, too!

Part no. 4722.

\$39.95.



Tamiya Toyota TS-020

You're looking at the star of what may become a new racing class—a new concept in R/C racing that blends the simplicity and performance of the venerable F103 F1 chassis with the sleek styling and ground-hugging characteristics of a World Sports Car body shell. The kit comes with rubber tires (not foam), so it will hook up just about anywhere. That's all we know as we go to press, but rest assured, the car will be affordable.

Call for info.

Kyosho MP-6 and MP-6 International

The MP-5 was a high-performance machine, but Kyosho has stepped up performance and quality again. The MP-6 has many of the MP-5's race features—shocks, differentials, chassis components, etc.—but also packs these new features:

- Gold chassis with kick-up.
- New suspension arms.
- Front universal axles.
- Stainless-steel disk brakes.
- And for those who want it all, there's the MP-6 International kit with all these additional items:
- Long, hard-anodized gray chassis with kick-up.
- Front rear center

universal.

- Double stainless-steel front brake and single stainless rear.
- Hard-coated shocks with bushing caps.
- Swaybars.
- Heat-sink engine mounts.
- ...and many other options.

Call for info.



Maxtec Shock Wave '99 modified motor

The potent Shock Wave has been revised for '99, and that means it's faster than ever. Here are some of its hot features:

- 1.5 mm V-Flow can.
- 8.0 magnets.
- Silver brush hoods.
- Copper brush damper.
- Heat-dissipating can coating.
- Symmetrical winding.
- Epoxy-balanced, reverse-taper armature.
- Kevlar-reinforced windings.
- Many winds available.

\$95



Kawada Molded tire inserts

These molded, foam-rubber tire inserts for mid-narrow tires are available in four compounds and are color-coded for easy identification.

Part nos. TU-31SS (super soft), TU-31S (soft), TU-31M (medium) TU-31F (hard).

\$4.50.



new
for '99



Novak XXL 2-channel FM receiver

Novak's smallest, lightest receiver is packed with features:

- Internal shielding protects against interference.
- Ultra-narrowband ceramic filter for 10Khz channel spacing.
- Ultralight (0.48 ounce).
- Low-voltage operation for glitch-free reception.
- External battery slot or DSC connection.
- Reverse-voltage protection.
- Meets 1999 FCC radiation limits.
- Available on all legal bands.

Part nos. 2427 (27MHz), 2475F (75MHz Futaba), 2475S (75MHz Sanwa/Airtronics), 2475K (75MHz KO), 2275J (JR Propo).

\$99.

Innoventive Z120 and Z170 CVEC power system

These tuned pipes are now designed specifically for 1/10 and 1/8 nitro cars. Their chamber size and length have been optimized to suit their specific applications. Both pipes still include CVEC's revolutionary variable-chamber-volume valve, which provides optimum performance throughout the rpm range and can reportedly improve fuel economy by up to 40 percent. Dual exhaust tips reduce engine noise and prevent dirt packing. Other features include:

- Adjustable backpressure valve.
- Fuel-pressure fitting.
- Durable aluminum construction.
- Available with red, blue, purple, black and gold anodizing.

Part nos. Z120, Z170.

Call for prices.

Victor Engineering IQ3 charger/discharger/analyzer

The high-end IQ3 is loaded with features and has upgraded software to make it easy to use. It has so many features and functions that it would take pages to list them all, but here's a sampling while we prepare a full review:

- 15A maximum charge rate.
- 40A maximum discharge rate.
- Linear, flex and thermal peak-charge modes.
- Motor break-in analyzer.
- Two-way PC linking.
- Optional battery-voltage zap.
- Optional multi-cell matching.
- ... and a whole lot more.

\$339.



Traxxas Nitro 4-Tec Pro

It looks as if Traxxas is taking a new direction with the Nitro 4-Tec Pro. Designed for top-level competition, it has the features hardcore

racers demand—all of the Nitro 4-Tec's best stuff plus the following factory hop-ups:

- Blue-anodized counter-sunk chassis.
- Graphite upper deck, rear brace and rear shock tower.
- Front and rear sealed ball differentials with aluminum diff gears.
- Foam front bumper.
- Hard-anodized, Teflon-coated shocks.
- Full ball-bearing set.
- Front and rear swaybars with adjustable mounts.
- Turnbuckles.
- Pro-Line V-Rage tires, and more.

Call for info.



Peak Performance Illusion rebuildable stock motor

Peak's new rebuildable mill has all the features of the company's Nightmare Stock II, which conforms to all ROAR stock-motor specifications. Peak offers a full line of parts, including armatures to suit your spec racing class. A blueprinted version that features a "selected" armature, diamond-cut commutator, full balancing, motor-can zapping and expert spacing is available complete with dyno printout.

Part no. PEK8000.

\$40.



RPM metric wrench set with stand

RPM's handy wrenches and convenient case/stand are now available in a metric set with 1.5-, 2-, 2.5- and new 3mm straight-tip wrenches. And since they're from RPM, the sizes are molded right into the comfy color-coded handles, and the tips are guaranteed not to round off. The 3mm wrench is also available separately and should be a natural for you gas guys (lots of 3mm screws on those 1/8 buggies, y'know).

Part nos. 8077

(4-piece metric set), 8074 (3mm hex driver).

\$34.95, \$8.95.



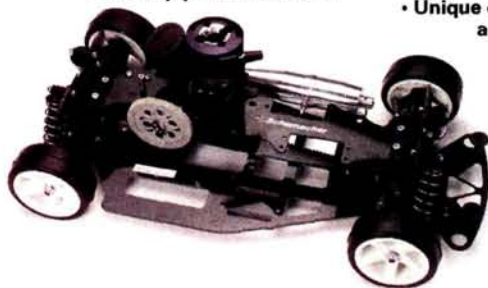
Schumacher Nitro SST touring car

Schumacher's much-anticipated nitro tourer shares the electric-powered SST's proven double-wishbone suspension, but that's where the similarities end. Scope out these features:

- Pro Spec .12 engine.
- Full ball bearings.
- S1 carbon-composite chassis.
- Tuned pipe with silencer.
- Innovative twin disk-brake system with steel pads.
- Racing slick tires with foam inserts.
- Unique drive system that accepts "regular" pinion and spur gears for simplified gearing changes.

Part nos. K002B (chassis kit), K001A (fully assembled w/BMW M3 body).

\$329.95, \$345.



Nuova Faor high-performance parts for Kyosho MP-5 and MP-6

Another of Ace Hobbies' racing lines, Nuova Faor high-quality accessories helped power the winner of the prestigious European Championships in 1997. Look for:

- Thorsen differentials.
- Hard-anodized 3mm chassis plate.
- Aluminum center diff/brake supports.
- Heat-sink engine mounts with lateral and front-to-rear adjustments.
- Stronger brackets for all suspension pivots.
- Ball-bearing aluminum steering center link.
- High-performance shocks and suspension parts.

Call for info.



new
for '99



GM Racing GMVIS Commander charger

This has all a serious racer demands. Here are some of the unit's features:

- Charges and discharges 1 to 30 cells.
- GMVIS charge mode.
- Peak charge.
- Temp charge (optional).
- Timer function.
- Cycle function (up to nine cycles).
- Two-line LCD display.
- Input fuse circuitry.
- Incorrect-polarization warning.
- Displays voltage, current, capacity, time, etc.
- Soft-touch controls.
- Built-in fan and much more.

Call for info.

O.S. .15 CV, .15 CV-X, .21 RZ-V and car 4-stroke

O.S. has added a few engines to its already extensive line for '99. The .15 CV features a larger bore than the .12 and is distinguished by its blue heat-sink head; it's available with a pull-start as the .15 CV-X. The .21 RZ-V was released just days before the Chicago hobby show, and a list of its features was not available. What was apparent was its new boost bottle and altered heat-sink-head finish. The R/C car 4-stroke caught lots of attention because it's the first such engine to hit our shores. Look for a test soon!

Call for info.

4-stroke



.15 CV

.21 RZ-V



Compagnucci Mini Cooper Trophy

This car from Italy could herald the Next Big Thing in our great hobby—1/8-scale gasoline ignition. These fully assembled Italian machines feature: 30 minutes of run time on cheap gasoline; 50mph top speed; and one-way-bearing equipped clutch bell for simple push-start operation. Also available with Ferrari F1 and F50, rally and off-road bodies.

Other features include:

- .40 gasoline ignition engine
- Belt-driven 4WD.
- Self-locking gear diffs.
- Upper and lower A-arm suspension with anti-roll bars
- Oil-filled coil-over shocks.
- Cut and colored bodies.

Part no. CRX02110.

Call for info.



Schumacher SST '99 Pro

The SST has been continually refined since it first hit the touring-car scene, and the '99 model has been honed for even higher performance. All-new parts and

features of note include:

- Low-CG suspension mounts.
- Revised top-deck design for greater rigidity and enhanced handling.
- High-volume, "short," purple shocks.
- New hub carriers (accept larger, 5x10mm bearings for enhanced

durability).

- Pin-and-hex wheel drive—no more friction washers.

Part nos. K004 (chassis kit), K003 (Assembled w/Peugeot body).

\$219, \$239.95.

CALL FOR INFO

Ace Hobbies (800) 3-TEAMJR; website: www.ace-hobbies.com.

Associated (714) 850-9342; website: www.rc10.com; www.team associated.com.

Bolink (770) 963-0252.

BRP (216) 284-0270.

BSR (205) 757-1564.

CEN (contact Genka).

Compagnucci (Italy; no U.S. distributor yet) +0731-245999.

Competition Electronics (815) 874-8001.

Deans (562) 634-9401; website: www.Deansco@earthlink.net.

DuraTrax (217) 398-6300.

Fioroni (call Ace Hobbies).

FSR (Full Speed Racing) (972) 618-7038.

Futaba (714) 455-9888.

Genka Trading Corp. 1800 E. Miraloma Ave., Ste. F, Placentia, CA 92870.

GM Racing (330) 530-2330 website: www.gm-racing.de.

Great Planes (217) 398-6300.

Hammad Ghuman (518) 458-8441.

Hitec/RCD (619) 258-4940; website: www.hitecrad.com.

Holeshot (508) 587-0663.

Hot Bodies (609) 893-7716.

HPI Racing (714) 753-1099.

Indy/Eagle (call Integy).

Innoventive Technologies (810) 677-2310; website: www.innoventive.com.

Integy (909) 444-2766.

JR Racing (217) 355-9511.

Kawada (425) 656-0688; website: www.kawadausa.com.

Kyosho/Great Planes (217) 398-6300.

LRP Wilhelm-Enssle-Str. 134, 7064 Remshalden, Germany.

Maxtec (714) 427-5180.

MRC (732) 225-6360; website: www.modelrec.com.

New Era (603) 880-3453.

Niftech (216) 257-6018; website: www.niftech.com.

Novak (949) 833-8873; website: www.teamnovak.com.

Nuova Faor (call Ace Hobbies).

OFNA Racing (714) 586-2910.

O.S. Engines (call Great Planes).

Parma/PSE (440) 237-8650.

Peak Performance (949) 707-4683.

Pro-Line (909) 849-9781.

Reedy Modifieds (714) 850-9342.

Robinson Racing Products (209) 966-2465.

RPM (909) 393-0366.

Schumacher USA (813) 889-9691; website: www.racing-cars.com.

Serpent Inc. USA (305) 639-9665.

Tamiya America (800) TAMIYA-A; website: www.tamiya.com.

Team Associated (714) 850-9342; website: teamassociated.com.

Team Losi (909) 465-9400; website: www.teamlosi.com.

Team Orion (call HPI Racing)

Tekin Electronics (714) 498-9518; website: www.tekin.com.

Thunder Tiger USA (816) 584-7121.

Traxxas Corp. (972) 613-3300; website: www.traxxas.com.

Trinity (732) 635-1600; website: www.teamtrinity.com.

Victor Engineering 380 Camino de Estrella, #170, San Clemente, CA 92672.

Yokomo USA (714) 252-8663; website: www.yokomousa.com.

thrash
TEST

1/4 scale gas



Kyosho **Quad** **ATV Rider** by Greg Vogel

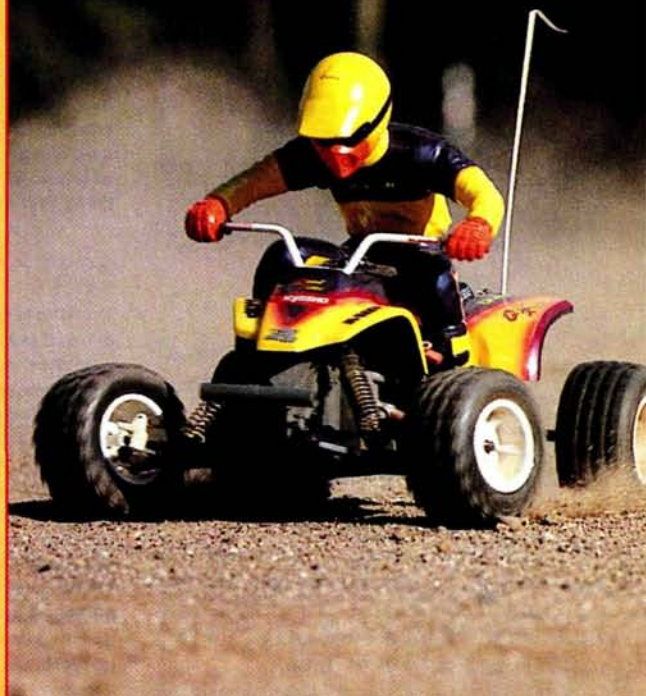
You've built them all Buggies. Trucks. Touring cars. Pan cars. That's the whole R/C spectrum, right? Think again! Kyosho* is well known for producing scale-looking "alternative" R/C vehicles such as its 1/8-scale, USA-1 monster truck, Shelby Cobra sedan and Nitro Blizzard Snow Cat.

The company recently added the new ATV Quad Rider to its growing list of exotics, and we're

sure it will become a popular alternative for those who crave something out of the ordinary.

The ATV Quad Rider is a 1/4-scale, 4-wheel dirt bike that comes complete with a rider figure. With its .12-size nitro powerplant, chain-and-sprocket drive train, independent front suspension and trailing-arm rear suspension, no one can deny the ATV's scale intentions. But can the ATV Quad Rider tear up the terrain as well as its full-scale counterpart? You'll have to read on to find out, but I will tell you this much: things are going to get dirty!

Q U A D
R I D E R - S C A L E



PHOTOS BY WALTER SIDAS

s p e c s

SCALE 1/4
LIST PRICE \$425

DIMENSIONS (chassis only)
Length overall 16.9 in. (429mm)
Wheelbase 12.4 in. (315mm)
Width 12.3 in. (312mm)

WEIGHT
Gross, RTR 4.7 lb. (2,130g)

CHASSIS
Type Molded frame with lower plate
Material Fiber resin/aluminum

DRIVE TRAIN
Type Chain drive
Primary Clutch bell/spur
Differential Ball
Bearings/bushings Bushings

SUSPENSION (F/R)
Type Lower A-arm adjustable upper link/single trailing arm
Damping Oil-filled coil-over shocks/single oil-filled coil-over shock

WHEELS (F/R)
Type One-piece molded

TIRES (F/R)
Type Ribbed/mini pins

POWERPLANT
Engine GS12S-CR
Muffler/pipe Muffler
Carb Barrel



YOU'LL NEED

- 2-channel radio with 2 servos.
- Glow-fuel (10- to 20-percent nitro).
- Glow-plug igniter.
- Paint for the body and driver figure.
- CA glue for the tires.

PERFORMANCE

When I get the chance to test a fun off-road vehicle, I immediately pack up my equipment and head to the local BMX track where there are dozens of jumps, obstacles and surfaces to run on.

A few pumps of the fuel tank's primer and a couple of tugs on the pull-start, and the ATV was rolling along. It takes off quickly with the 16-tooth gear and is very quick at the top end. Because of its borrowed Pro XRT front suspension, I was expecting the Rider to handle like a stadium truck, but the solid rear arm and axle don't soak up the bumps the way an independent suspension system can. The Rider's rigid axle tosses it around somewhat, but it's not uncontrollable.

Next, it was time to see how the ATV would fare while jumping. I pulled the throttle and sent it over a mild roller jump; the back end kicked up and sent the Rider cartwheeling for a few feet. After some unsuccessful jumps, it became apparent that the Rider is in its element on a flat surface. I did have a lot more fun on asphalt and soft dirt; the Rider really kicks up a rooster-tail.

For a second and third opinion, I handed the radio to editors Peter Vieira and Chris Chianelli. Pete put it through the paces and managed to flip it only once; Chris, on the other hand, managed a series of flips in a few minutes' time, pulled a 10-foot-long axle grind down a curb and then hit a tree.

BUILDING & SETUP TIPS

- Even though the ATV's chassis arrives partially assembled, take a moment to make sure that all of the screws are tight.
- Remove the screws that secure the engine to the chassis, put a dab of liquid thread-lock on each one and then reinstall them. Be sure to remove and reinstall the screws one at a time or you will have to reset the clutch bell and spur-gear mesh.

DRIVE SYSTEM

A clutch bell and spur gear are used as the primary drive, while a chain and two sprockets are used to drive the rear axle. The chain tension can be adjusted to compensate for wear via the chain guard/tensioner. The rear axle looks like a one-piece design, but a ball differential has been incorporated into the drive-sprocket assembly. There's no question that the ball diff will improve the ATV's cornering.

BODY AND RIDER

The ATV's body is made of Lexan, just like a normal R/C car body. The rider figure, however, is made of vinyl and must be painted with lacquer or acrylic paint. His shoulders, neck and waist pivot, and he attaches to the ATV's body with clips. Plastic handlebars and the fuel-tank cap help give the bike a realistic look, and decals are supplied for both the body and rider figure.

SOLID-AXLE REAR SUSPENSION

You won't find independent suspension on the rear of the ATV. Rather, a single molded-fiber-resin swing arm is damped by a Kyosho oil-filled, coil-over platinum shock. The monoshock has to support a lot of weight, and it requires heavier shock oil than is included with the kit. I recommend that you fill the monoshock with Kyosho 1,000 to 3,000WT oil.

.12 ENGINE

Kyosho's reliable GS12S-CR engine with pull-start is bolted onto the ATV's aluminum chassis plate. The engine is fitted with a 16-tooth clutch bell, and a Kyosho muffler with an extension tube allows the exhaust to exit toward the rear of the bike.

MOLDED FRAME AND ALUMINUM CHASSIS

The ATV's unique frame consists of several molded-fiber-resin components; when bolted together, these pieces provide a solid backbone. The frame's open design allows easy access to the ATV's major components, thus making it an easy vehicle to work on. A lower aluminum plate provides a sturdy foundation for the engine and helps dissipate heat.

INDEPENDENT FRONT SUSPENSION

If the ATV's front suspension looks familiar, it's because many of the suspension components were taken from Kyosho's Pro XRT racing truck. The XRT's wide stance and long-stroke, fluorescent green, oil-filled, coil-over shocks should give the ATV stability over the rough stuff.

LINKAGES

The ATV Rider uses a unique linkage setup to control the throttle and brake. The throttle servo is mounted above the engine. The throttle linkage consists of a piece of music wire with Z-bends and a spring loop that moves the barrel of the carb. When you hit the brake, a pull cable slides through a tube (similar to the system used on bicycles) and pulls the brake lever, which makes contact with a fiber pad on the clutch bell to slow the ATV.

TEST GEAR

• Futaba Sport radio with 3003 servos • DuraTrax receiver battery • Byron nitro fuel

They were both pleased with the ATV's performance, though little did they know that I had given them the wheel with an

ulterior motive: to see how durable the ATV was. If anyone can hack a car, it's these two guys, but the ATV survived!

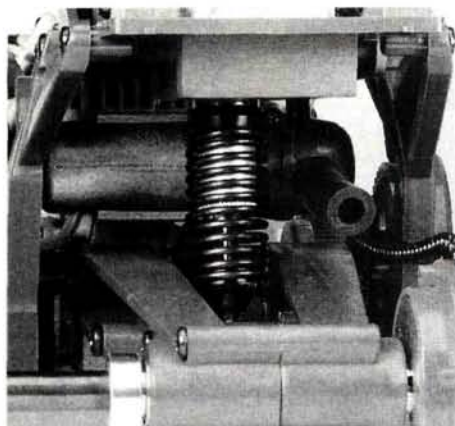
■ The kit does not include foam inserts for the tires. I picked up Kyosho foam inserts and installed them inside the front and rear tires; you might want to do the same.

■ Glue the tires to the wheels with CA glue. If you don't, the tires will be thrown off the wheels the first time you squeeze the trigger.

■ The oil for the rear shock is too light; it caused the ATV to bounce and spin out easily. Use 1,000WT

Kyosho oil to increase damping in the rear monoshock.

■ The cast head on the engine doesn't dissipate heat as well as an aluminum head would. This may cause the engine to overheat and wear out its internal components more quickly. To counteract the problem, run the engine rich. A rich mixture will lubricate the engine better, but will reduce power slightly.



A monoshock damps the rear swing arm. The shock's style resembles that of the old Kyosho platinum shock. The stock exhaust dumps the gases out of the back of the bike—pretty trick.



Likes

- Scale looks.
- Fun, exotic vehicle.
- Factory pre-assembly speeds building time.
- Ball differential.
- Open-frame design (low parts count and easy to work on).



dislikes

- Foam tire inserts not included.
- Included oil is too light for the rear shock.
- Painting the rider figure is a pain.

Revamped Rider

Kyosho's Quad ATV Rider is a blast in stock form. I ran it until the tires looked like a set of sedan slicks. As you might have guessed, I'm never satisfied with something unless it's hopped up. Here's what my sick mind came up with for the ATV.

Starting up front, I replaced the bushings in the wheels with bearings and swapped my worn-out tires for Pro-Line* Dirt Hawg tires (part no. 1070). To smooth out the damping and improve the ATV's looks, Kyosho's Teflon shocks replaced the composite stock units. I filled the shocks with 40WT oil and retained the stock springs. I slipped a servo-saver retaining spring over the saver to reduce flex and increase steering throw.

At the other end of the machine, I replaced all of the bushings with Kyosho ball bearings to reduce friction and wear. I replaced the rear tires with another set of Pro-Line Dirt Hawgs. These meats give the ATV a mean look, provide tons of traction and look scale.

Next, I had to give the ATV more power, so I replaced the restrictive stock muffler with MIP's* new stinger (3053) for the Quad ATV Rider. This allows the engine to breathe better and gives it more power—not to mention it looks cool and sounds like a real dirt bike!

I removed the clutch bell and replaced the



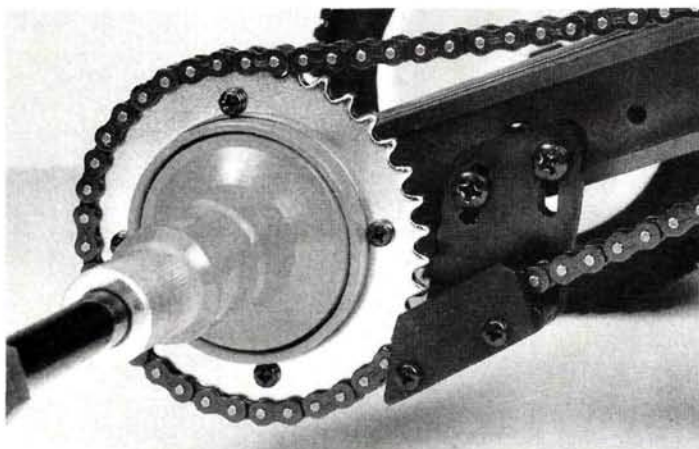
KYOSHO PARTS

- Ball bearings—part no. 1901 (5x10); 1911 (8x14); H-3048 (6x10).
- Inner sponge—W-5037.
- Fuel filter—39308.
- Servo-saver reinforcing spring—39735.
- Ultimate shocks—KYOC 5845.
- Vespel clutch shoe—39671.
- One-piece clutch bell (16T)—92616.

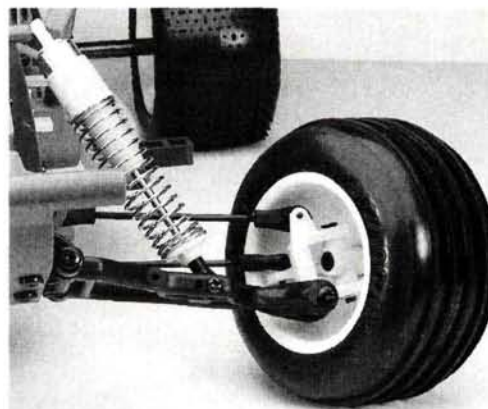
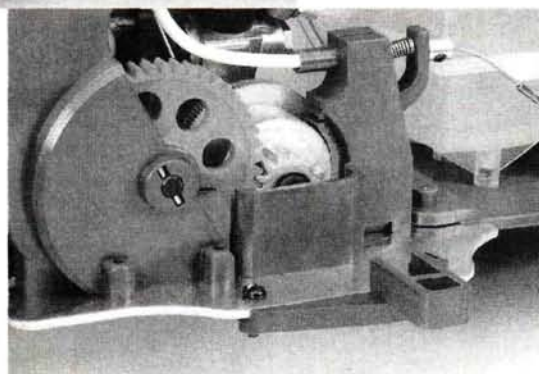
clutch shoes with MIP's Kyosho Quad Clutch Kit (3051). The shoes have three adjustment holes that change the engagement of the clutch. I went with the center hole, which allows the clutch to engage at a higher rpm for more bottom-end response. I replaced the stock, soft-metal clutch bell with a 16-tooth, one-piece, steel clutch bell that's supported by two 5x10 bearings.

Last, I yanked off the thin fuel and exhaust lines and replaced them with some Kyosho silicone fuel line purchased at my local hobby store; then I installed Kyosho's in-line fuel filter for extra protection against dirt.

The revamped ATV Rider is even more fun than it was before; the bearings, pipe and clutch really give the bike an extra boost of power, which makes it that much more fun to drive. Pro-Line's Dirt Hawg tires are also a welcome addition. They grip any surface and wear well, thanks to their big tread pattern.



Above: a large stamped-steel sprocket is attached to the ball differential and axle assembly. Check out the mini chain; looks scale, doesn't it? The chain guard also acts as a chain tensioner: simply loosen the two screws and slide the unit up and down. Right: the brake assembly is mounted in front of the clutch bell. Notice that a cable rides through a plastic tube to the brake lever. A fiber pad glued to the lever slows the ATV as you engage the brake.



Kyosho's Pro XRT racing-truck arms made their way to the ATV. The front suspension is damped by fluorescent-green composite shocks, and traction is maintained by Kyosho ribbed tires.

FINAL THOUGHTS

Looking for something new, different and fun? Then Kyosho's Quad ATV Rider may be just what you want. Starting with its partially assembled chassis and ending with its true-to-scale appearance, the Quad ATV Rider has a lot going for it. Take these features, add reliability and durability, and you have an awesome recreational R/C vehicle. Way to go, Kyosho!

*Addresses are listed alphabetically in the Index of Manufacturers on page 273.



Tamiya by Louie Patterelli **Mini Cooper Racing M-03**

Break out your hankies. The spunky M-01 Mini Cooper that won our hearts back in 1995 is getting ready to go to pasture; Tamiya's* new M-03 Rover Mini Cooper Racing is the next step in M-chassis evolution.

New from the ground up, the M-03 shares only its wheels, dogbones, pinion gear and differential with the original M-car. The rest of it is more closely related to the TL01 4WD sedan chassis, which has proven to be durable and easy to drive. If those traits have been passed along to the M-03 along with the original M-car's fun spirit, then the oh-three should be a hit. Let's see how it measures up.



ROBOCOOPER: TAMIYA'S CLASS-CREATING MINI IS REBORN

PHOTOS BY WALTER SIDAS



s p e c s

SCALE 1/10
LIST PRICE \$131.99

CHASSIS DIMENSIONS
Wheelbase 8.27 in. (210mm)
Width (F/R) 6.30/6.38 in.
(160/162mm)

WEIGHT
Gross (as tested) 43.9 oz. (1,244g)

CHASSIS
Type Molded monocoque-type
Material ABS plastic

DRIVE TRAIN
Type Sealed gear
Primary Pinion/spur
Drive shafts Dogbones
Differential(s) Bevel gear
Slipper clutch None
Bearings/bushings Bushings

SUSPENSION (F/R)
Type Lower A-arm /one-piece upper link
Damping Coil-over friction shocks

WHEELS (F/R)
Type One-piece plastic
Dimensions (DxW) 40x25mm

TIRES
Type (F/R) Tamiya 60D mini radial

ELECTRICS
Motor Mabuchi 540
Battery Not included
Speed control Mechanical
3-speed w/reverse

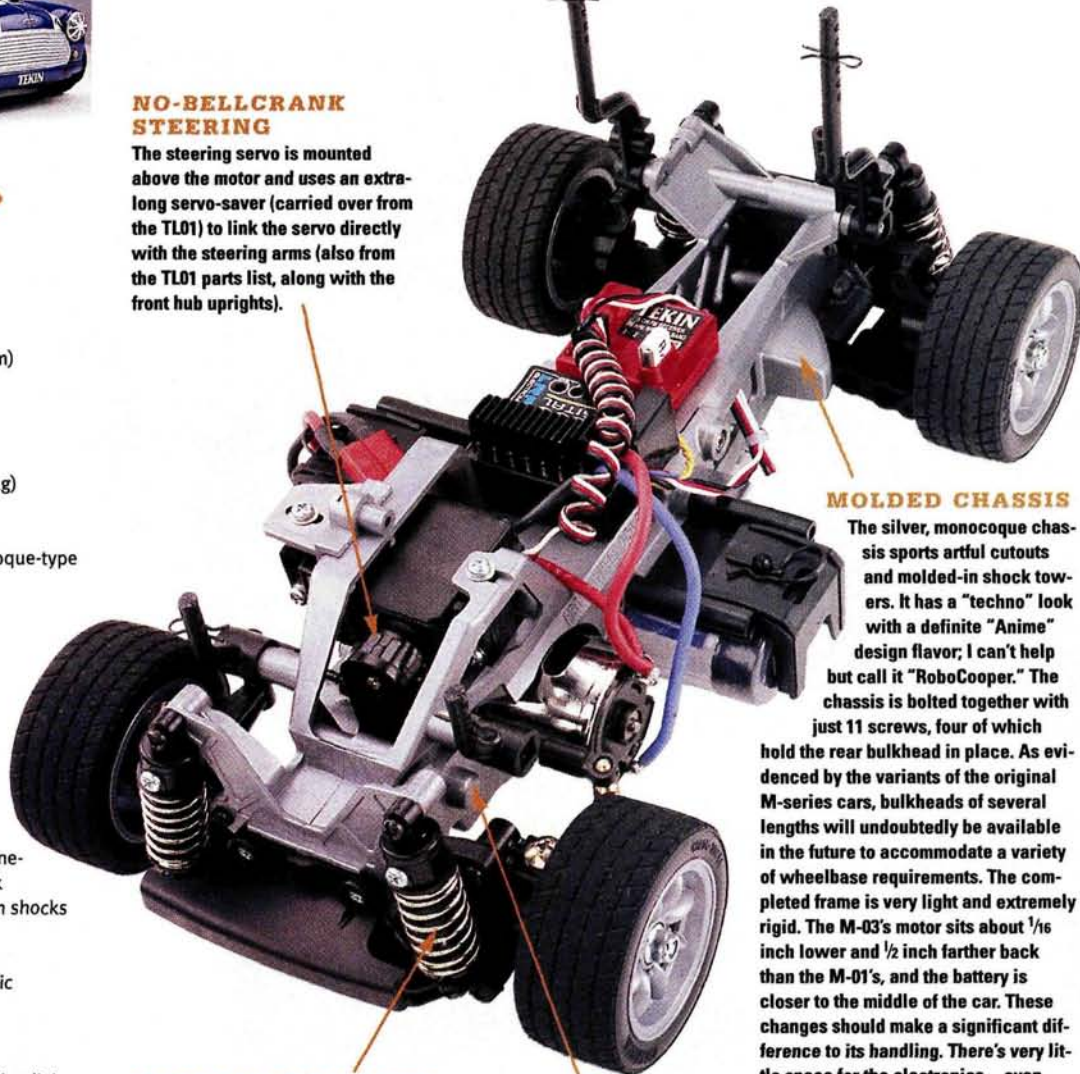
LIGHTER BODY

Bodies are always Tamiya's strong point, and the Mini body is beautifully detailed. The grill is now molded in (the original's was a separate plastic piece), and the add-on bumpers have been omitted. These modifications were undoubtedly made to save weight, hence the racing designation.

In addition to the aforementioned changes, the wheel arches are larger to accept the taller, more performance-oriented 60D tires. Using Tamiya's Mini Cooper Racing Sticker set (part no. 53221), I added a few personal touches to make the car look even racier.

NO-BELLCRANK STEERING

The steering servo is mounted above the motor and uses an extra-long servo-saver (carried over from the TL01) to link the servo directly with the steering arms (also from the TL01 parts list, along with the front hub uprights).



MOLDED CHASSIS

The silver, monocoque chassis sports artful cutouts and molded-in shock towers. It has a "techno" look with a definite "Anime" design flavor; I can't help but call it "RoboCooper." The chassis is bolted together with just 11 screws, four of which hold the rear bulkhead in place. As evidenced by the variants of the original M-series cars, bulkheads of several lengths will undoubtedly be available in the future to accommodate a variety of wheelbase requirements. The completed frame is very light and extremely rigid. The M-03's motor sits about 1/16 inch lower and 1/2 inch farther back than the M-01's, and the battery is closer to the middle of the car. These changes should make a significant difference to its handling. There's very little space for the electronics—even less, if the supplied mechanical speed control is used.

FULLY INDEPENDENT SUSPENSION

The two-piece suspension arms are models of strength and durability, but the biggest news in the "boing" department are the four friction-type shock absorbers that grace each corner with independent control; no more linked monoshocks!

THREE-GEAR DRIVE TRAIN

Consisting of a bevel differential, a countergear and a spur gear, the transmission is simple, dependable and needs practically no maintenance. The 20-tooth pinion gear delivers long run times with the stock powerplant and should be adequate for most motors. You'd have to be just a little loopy to put a serious modified motor in a short-wheelbase, front-wheel-drive car, but I'm sure a few of you will attempt to own the Mini Cooper land-speed record.

TEST GEAR

• Tekin* TMF27 receiver. • Futaba* 3PDF. • Futaba S3003 steering servo. • LRP* Indy 600 speed control.

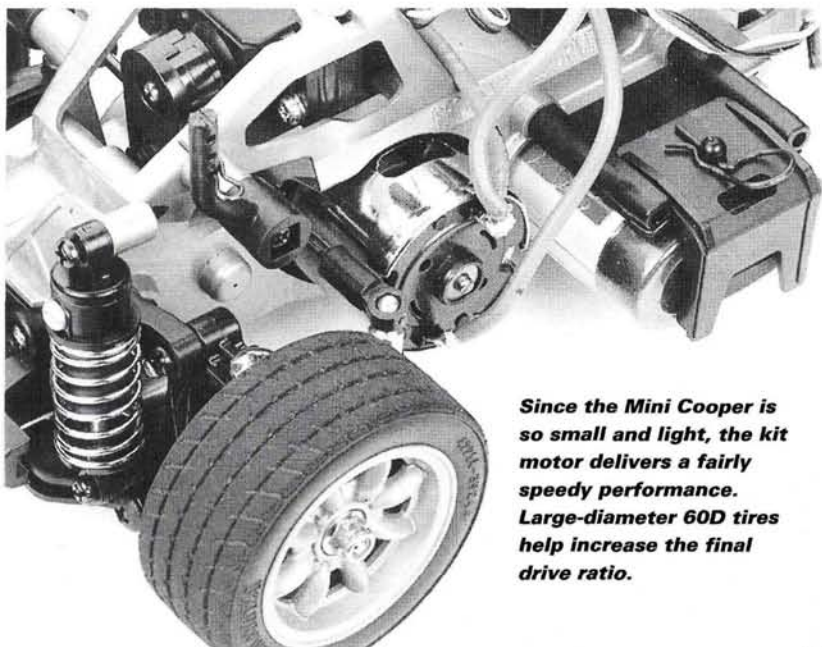
PERFORMANCE

Nailing the throttle on the first-generation M-chassis produced a violent wheel shaking as the car struggled to put power down. This is where the M-03's refinement is obvious; punch the gas and you're rewarded with a smooth, brisk squirt of speed—no drama.

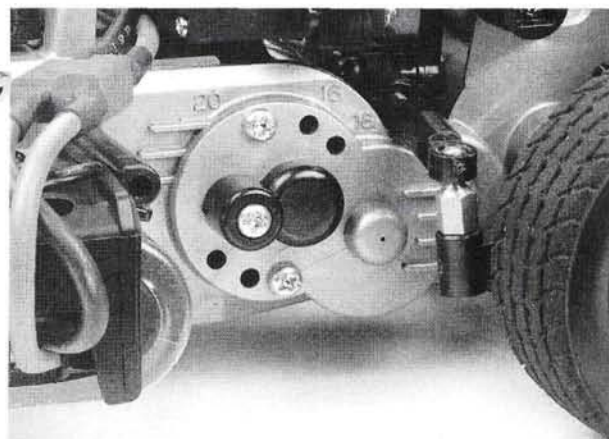
Setting up for a turn with the old car was a strategic endeavor that required lifting the throttle at just the right point to get the tail end to slide out and rotate the car into the turn. If that didn't loop the car, you then had to ease back on the gas at the apex to settle the chassis down for the exit. In contrast, the M-03 is completely forgiving. Throw it into a corner at

full blast, let off the throttle a little at the entrance, and punch it coming out—no balancing act with the throttle; the chassis just soaks up the G-forces. It's fun, and you can do it with surgical precision.

I'm really looking forward to the next Tamiya Championship Series race; Japan, here I come!



Since the Mini Cooper is so small and light, the kit motor delivers a fairly speedy performance. Large-diameter 60D tires help increase the final drive ratio.



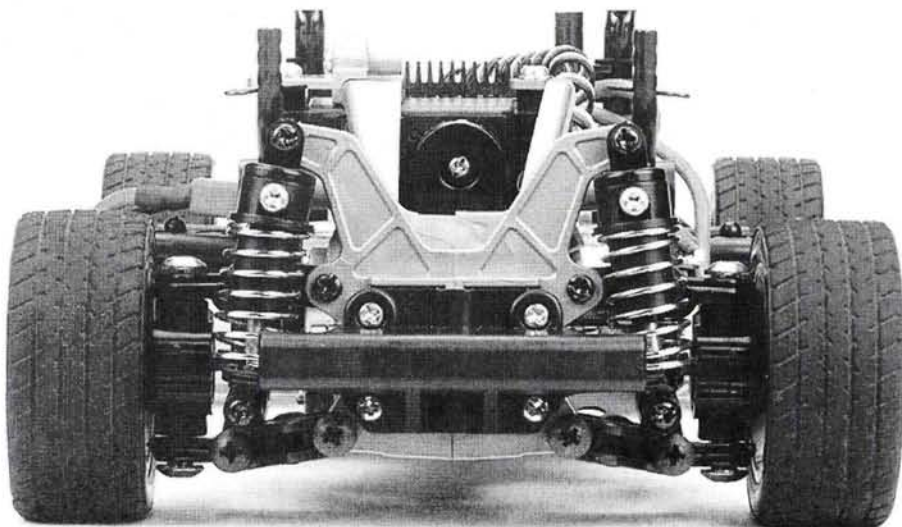
Above: here you see the three pinion options. Preset gear mesh makes motor installation a no-brainer. Below: in this front view, note the steering servo's high position and the ESC fins that poke up from behind it. Although the electronics are carried quite high on the chassis, the M-03 handles well.

YOU'LL NEED

- Polycarbonate-compatible paint.
- 7.2V stick-pack battery.
- 2-channel transmitter and receiver.
- Steering servo.
- Throttle servo (or ESC).
- CA glue.

FACTORY OPTIONS

- Low-friction aluminum damper—part no. 53155.
- Tuned-spring set—53163.
- 60D reinforced Type-A tires (pair)—53340.
- Mini reinforced wheels (pair)—53341.
- M-03 swaybar set—53343.
- M-03 motor heat sink—53344.
- M-03 bearing set—53348.
- Quick-release battery holder—53346.



BUILDING & SETUP TIPS

■ Tamiya's instructions are always first-rate, but pay particular attention

when you assemble the suspension arms; if you don't line up the little nubs on the ends, you'll soon be wondering why the suspension is binding (yes, I did learn that from experience!).

■ Don't skimp on the grease in the diff or the shocks. If you have any kit grease left when you've finished building the kit, you didn't use enough.

■ To improve handling, lower the car by installing a no. 1 spacer on the shock shafts (inside the shock body).

■ A set of bearings will go a long way toward improving speed and run time. An inexpensive aftermarket set will work fine, but if you don't mind paying a little more, Tamiya's sealed bearings are the best.

Likes

- Tamiya quality—always a standout.
- Very easy to build.

- Steering servo sits a bit high (but where else could they put it?).
- Cramped quarters for electronics, even if using small components.

dislikes

FINAL THOUGHTS

Tamiya's latest Mini Cooper kit captures the fun spirit of the original M-01-chassis Mini Cooper but has none of its drawbacks—or shall we say “endearing idiosyncrasies.” Its performance is better, and it's easier to build than its pioneering predecessor. Taking the M-chassis to the next level was something Tamiya's designers had to do, and they did it right.

*Addresses are listed alphabetically in the Index of Manufacturers on page 273.

THE COMPETITION

	HPI RS4 MINI	Tamiya M-01	Tamiya M-03	RoadRunner GTO
Wheelbase	8.9 in. (226mm)	8.25 in. (210mm)	8.27 in. (210mm)	8.25 in. (210mm)
Width (F/R)	6.3 in. (160mm)	6.25 in. (159mm)	6.3 in. (160mm)	6.25 in. (159mm)
Weight	46 oz. (1,304g)	45 oz. (1,276g)	43.9 oz. (1,245g)	45.6 oz. (1,293g)
Diff type	Gear	Bevel gear	Bevel gear	Ball diffs
Chassis	Fiberglass	Plastic	Plastic	Carbon fiber
List price	\$209.99	\$154.99	\$131.99	\$325
Available at*	\$139.99	\$100	\$100	\$179.95
Reviewed in	5/98	9/95	1/99	4/97

*Prices vary with location



Mugen **MBX-4**

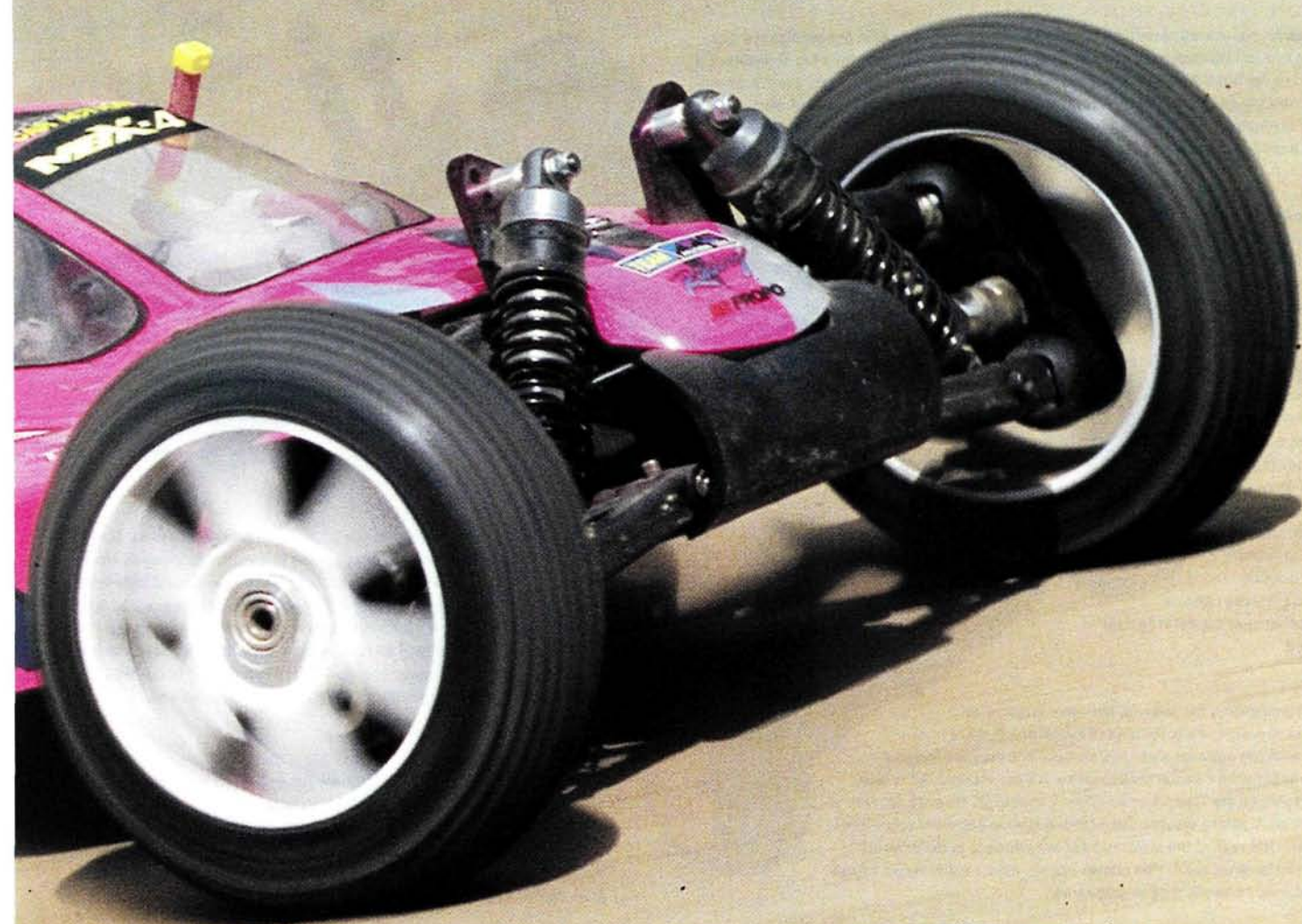
by Steve Pond

If you're thinking about entering the ranks of the 1/8 nitro buggy racers, you're about to embark on the ultimate form of off-road racing. One-eighth buggies are the fastest, most powerful and most technically sophisticated of the breed. Leading this elite field of racers is the new Mugen MBX-4—the latest in the company's long line of competition-class buggies.*

Mugen's previous offerings were very competitive, but the almost entirely new MBX-4 has the most impressive list of innovations and standard components ever seen on an R/C buggy. It shares only its shocks and differentials with its older brother, the Super Athlete.

PHOTOS BY WALTER SIDAS

IS THIS THE ULTIMATE 1/8-SCALE BUGGY?



s p e c s

SCALE 1/8
LIST PRICE \$745

DIMENSIONS
Length overall 19.2 in. (488mm)
Wheelbase 12.8 in. (325mm)
Width (F/R) 12 in. (306mm)

WEIGHT
Gross (RTR) 88.7 oz. (3,400g)

CHASSIS
Type Channeled plate
Material 3mm aluminum

DRIVE TRAIN
Type Shaft
Primary Clutch bell/spur
Drive shafts Universal
Differential(s) 4-gear bevel with aluminum housing
Clutch 3-shoe
Bearings/bushings Bearings

SUSPENSION
Type (F/R) Double A-arm/lower A-arm w/upper link
Damping(F/R) Oil-filled coil-over

WHEELS
Type (F/R) One-piece plastic

TIRES
Type (F/R) Mugen 640/Victory SS

POWERPLANT USED (not included)
Engine Mugen .21
Carb Mugen slide-type
Pipe NovaRossi 9886
Horsepower NA
Fuel used Blue Thunder* 20%

RADIO USED (not included)
Transmitter JR* Racing R-1
Steering/throttle servos Airtronics* 94257

MUGEN MBX-4



ALUMINUM CHASSIS

A 3mm-thick, channelled-aluminum chassis reinforced by an aluminum radio tray and a pair of tension rods is standard on the MBX-4. The included stone guards support the running gear and protect it from dirt and debris. For improved handling on bumper tracks, the chassis has 10 degrees of front kick-up.

BEVEL-GEAR DIFFERENTIALS

All three diffs are of the four-bevel-gear variety. The diff housings are made of strong, long-lasting aluminum. Each is sealed with a gasket and O-rings, and this allows the use of heavy diff lubes for tuning. You can remove all three diffs by removing just six screws.

BRAKES

The MBX-4's unique braking system features a pair of metal disks with fiber/rubber brake pads (conventional systems use steel pads and a fiber disk). This system provides best-in-class braking power and is more resistant to fading than any other system I've tested.

FRONT SUSPENSION

The front suspension has many of the same features as the rear suspension. It has the angled hinge pins that are secured with the optional aluminum mounts, and they are isolated from the bulkhead for easier maintenance. A front anti-roll bar is standard. Spacers on the upper A-arms allow a total of 13, 16, or 19 degrees of caster for more tuning options. The steering system borrows technology from 1/8 on-road racing: the steering hubs are attached to the arms with large-diameter pivot balls. This allows infinite front camber-angle adjustment and a very smooth, rugged suspension.

REAR SUSPENSION

The rear suspension is of the lower A-arm, adjustable upper link variety. The upper link features stock turn-buckles, while the lower arm offers adjustable rear toe. The hinge pins that attach the lower arms to the chassis are secured with the optional aluminum mounts. These mounts are separate from the bulkhead, and that makes maintenance considerably easier. The hinge pins are angled

RADIO BOX

A radio box shields the electronics from the elements. The receiver battery is stored outside the box and was designed to accept a 5-cell, 500mAh pack, but you can squeeze in a 900mAh pack if you try.

in a way that extends the wheelbase on the outside of the car during a turn, and provides a subtle amount of anti-squat. This enhances stability and improves handling in the turns. Damping is handled by a pair of hard-anodized aluminum shocks that feature a rubber dust boot to protect the shafts and seals. An anti-roll bar is standard.

ENGINE

I used the Mugen .21 buggy engine for my tests. Made in Italy, it is remarkably similar to an older Rex engine from NovaRossi. It's coupled to an optional NovaRossi 9886 tuned pipe using a Mugen header and exhaust coupler. Notice that the engine is on the car's left side. Previous Mugen buggies had the engine on the right—an atypical design. Now that Mugen has at last "gone left," so it's easier to use standard tuned pipes and starter boxes, which are typically designed for this configuration.

UNIVERSAL DRIVE SHAFTS

This is one of the chinks in the MBX-4's armor. Universal drive shafts are usually good things, and having them here is no exception to that. The problem is that the stock front U-joint pivot points aren't in line with the steering pivots. This puts unnecessary tension on the U-joint, and if you don't set the car down perfectly off a jump, this might break it. I replaced the stock drive shafts with a set of MIP's massive CVDs, which cured the problem.

ANODIZED-ALUMINUM PARTS

The shock towers and chassis are made of purple-anodized heavy-gauge 7075 T-6 aluminum. It's incredibly resistant to being bent and has a much better "memory" (after flexing, it returns to its original shape) than the more common, less expensive, 6061 aluminum found in many other kits. The radio tray, center diff brace and upper steering front bulkhead are made of 6061 T-6 aluminum.

YOU'LL NEED

- 2-channel radio (FM recommended).
- High-torque servos.
- Receiver battery pack.
- 3.5cc rear-exhaust engine.
- Tuned pipe.
- Exhaust header and coupler.
- Tires and foam inserts.
- Glow igniter.
- Starter box.

- High-quality 7075 T-6 aluminum chassis.



- Aluminum diff housings and steel main gear.
- Steel brake disks for better stopping power.
- Innovative and highly adjustable suspension.

- Doesn't include tires.
- Bearings don't have rubber seals, so they're easy to foul.
- Front universal joints are fragile.



dislikes

FACTORY OPTIONS

Tires

- Fuzzie Victory (soft/super soft) — C1103/C1104.
- V-spike Victory (soft/super soft) — CC1121/C1122.
- Directional-pin Victory (soft/hard) — C1127/C1128.
- Foam inserts (soft/medium) — C1129/C1130.

Lightweight wheels

- 6-spoke (pink/yellow/green) — C1124/C1125/C1126.

- Manifold spring — Co903.
- Exhaust gasket — 21000.
- Tuned pipe — Co907.
- Header — Co950.
- Molded wing — C1010.

Aluminum parts

- Mounts for:
 - center diff — Co166.
 - front suspension — Co169.
 - rear suspension — Co170.
- Tension rods — Co176.
- Chassis posts — Co359.
- Engine mounts — Do702.

- Graphite radio plate — part no. Co360.
- Anti-roll bars (F/R) — Co171 (2.3)/Co172 (2.7), Co175 (2.3).
- Springs (F/R) — Co554 (soft), Co556 (hard)/Co555 (soft), Co557 (hard).
- Shock piston (2-hole) — Co560.
- Servo-saver bearings (6x10mm) — Co605.
- Shoe for 3-pin clutch — Co711.
- Clutch bell — Co720 (14T), Co721 (15T).
- Turnbuckle tie-rod set — Co856.

TEST GEAR

• JR Racing R-1 radio • Airtronics 94257 servos • Mugen .21 engine
• Blue Thunder Race Blend 20-percent-nitro fuel • NovaRossi pipe

PERFORMANCE

While testing the MBX-4 for our "1/8-Scale Buggy Guide" (December '98) and racing it locally, I've notched up plenty of wheel time with it. It comes off the line as hard as any other buggy I've ever driven, and it excels in other areas. Its new suspension geometry makes the MBX turn in better than any other buggy, and it offers similar performance when powering out of a turn. To get it around the corners as quickly as possible, I've found that it needs a little rear-end brake bias. In stopping power and consistency, its braking is the best in its class.

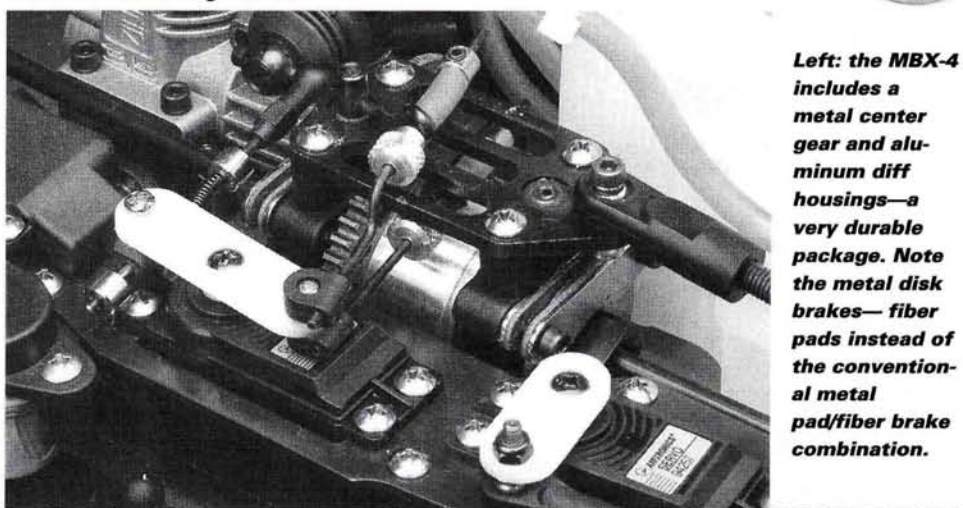
It's more durable than most out-of-the-box buggies, and right out of the box, it has most of the go-fast, long-lasting goodies. I did manage to break the pins in two front universal joints before I replaced the drive shafts with a full set of MIP Shiny CVDs.

I also managed to smoke some of the very high-quality NMB stock bearings; they only have metal shields, and they let debris into the bearing. This condition isn't unique to the bearings included with the Mugen kit; all shielded bearings will eventually fall

bearings from Boca Bearing replaced the metal-shielded bearings that came with the kit. The metal-shielded bearings are prone to contamination that can damage them.



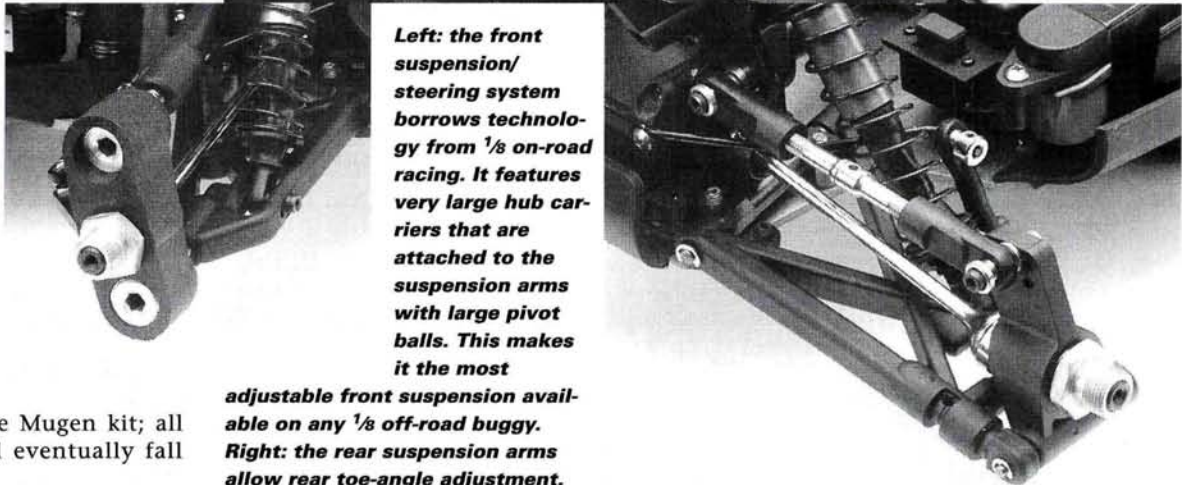
Left: the MBX-4 includes a metal center gear and aluminum diff housings—a very durable package. Note the metal disk brakes—fiber pads instead of the conventional metal pad/fiber brake combination.



Left: the front suspension/steering system borrows technology from 1/8 on-road racing. It features very large hub carriers that are attached to the suspension arms with large pivot balls. This makes it the most

adjustable front suspension available on any 1/8 off-road buggy.

Right: the rear suspension arms allow rear toe-angle adjustment. Note the angle of the hinge pins.



BUILDING & SETUP TIPS

By its very nature, a sophisticated, competition-class 1/8 buggy assembly is highly labor intensive. There are simply a ton of parts on this type of car, so it will take some time to put it together properly. The instruction manual relies more on exploded-view diagrams than on written directions, but the drawings are very clear and include notes where necessary. Time and time again, I hear someone say he has lost a 1/8 buggy part, and it's almost exclusively the result of his failure to use thread-lock. Use it!

■ Steps 1 and 2. When you assemble the differentials, use a heavy silicone diff lube to tune them. Track conditions will dictate which lube viscosity is best, but a good place to start would be 10,000WT in the center diff, 3,000WT in the rear diff and 5,000WT in the front diff.

■ Step 5. Don't forget the O-ring that must be installed in the servo-saver spring-tension adjuster. The MBX servo-saver is upside-down in that the spring and the adjusting collar face downward. If you forget to install the O-ring in the adjusting collar, the collar

will vibrate loose and cause excessive slop in the servo-saver.

■ Step 7. Don't install the down-travel screws in the suspension arms. I wouldn't say the suspension arms have too little down-travel, but I think the car handles much better with full suspension travel on all but the flattest tracks.

■ Step 10. When tightening the retainers for the front-suspension pivot balls, be careful not to overtighten them, or the suspension will bind. Keep an eye on this area; over time, the retainers

The MBX features a full set of high-quality NMB ball bearings for the drive train. The problem is that they have a standard metal shield that allows small dirt particles and other debris to get inside and foul the bearings. In just three runs, four of the axle bearings that support the drive shafts seized. As a solution, I installed a full set of rubber sealed bearings from Boca Bearing. They create a little more drag than the shielded bearings, but I prefer a car that works to one that's broken down.

will wear steadily, and they may have to be tightened a few times a season.

■ Step 18. The kit doesn't include a fuel filter, and this is the step in which you might want to install one. If you have the option, choose a filter that has an aluminum body and that allows the fuel to flow freely.

■ Step 20. The instructions fail to point out that you must isolate the radio receiver from vibration. Pack foam around it while it's in the radio box; that should do the trick.

■ Step 22. When you adjust the brakes, adjust them to provide a little more rear braking than front braking. This will help the MBX get around corners under braking.

■ Step 26. The instructions don't provide initial setup info on shock oil, but Richard Saxton (Team Mugen driver and TQ at the Nats) suggests 25WT Team Associated* pure silicone oil in both front and rear shocks and recommends the use of the stock 2-hole pistons and MIP* 1/8 shock springs.



The stock drive shafts (left) were replaced by MIPs Shiny CVDs, which are much stronger and more durable.

THE COMPETITION

	Kyosho MP-5	Laro D2 DIABLO	Mugen MBX-4
Wheelbase	13 in. (325mm)	13 in. (322mm)	13 in. (325mm)
Width	12 in. (300mm)	12.5 in. (318mm)	12 in. (306mm-310mm)
Weight	112 oz. (3,200g)	121 oz. (3,464g)	119 oz. (3,400g)
Diff type	Sealed	Non-sealed	Sealed
Brakes	Plastic/rubber	Fiber	Steel
Exhaust	Not included	Not included	Not included
Available at*	\$470	\$410	\$470

*Prices vary with location.

prey to this problem. As the bearings were fouled, I replaced them with high-quality rubber-sealed bearings from Boca Bearing*. When they are fresh, this type of bearing has more friction than a "shielded" bearing, but they last much longer. Once they have been "broken in," you won't notice a difference—other than that you no longer have to run into the shop every weekend to buy new bearings!

FINAL THOUGHTS

Though I have a couple of minor complaints about the MBX-4's bearings and drive shafts, you can expect a world-class performance from it. In our December '98 issue's "1/8 Nitro Buggy Guide," it earned the highest score—and for a very good reason: it's simply the best available all-around competition buggy.

By the time you read this, Mugen will have its own distribution center in the States, so Mugen kits, parts and customer service will be readily accessible. The MBX has just been released with a list price of \$470, so it's at the top of the price spectrum for a 1/8 nitro buggy. It's in the same price category as the few other competition-class buggies, but it certainly offers the most for the money. It simply has too much standard "high-quality" equipment for it to be inexpensive, but in the end, it costs you less because the trick stuff comes in the kit. The bottom line is that even though it may top the price list, it's at the benefit of ultimate performance. As the saying goes, "Speed costs money; how fast do you want to go?"

Is the MBX-4 light years ahead of its competition? Certainly not. Other very capable buggies will pass you in a second if you aren't on your game. But all other things being equal, I think you'll have the best shot with the MBX-4.

*Addresses are listed alphabetically in the Index of Manufacturers on page 273. ■

SANYO

Winner of
numerous club races,
regional races and
national races!!

Pushed
Nuclear Power



Winner of 98'
Florida
Winterchamps
2WD Stock.

**WINNING IS NO
LONGER A DREAM**

RC1700 & RC2000 also available matched or in sport packs.

DISTRIBUTORS:

CALIFORNIA
(408) 377-2361

ENGLAND
014-83236163

HONG KONG
852-26992033

Additional Distributorships Available Worldwide

Competition RC Imports Inc.

CANADIAN DISTRIBUTOR FOR:

Sanyo, Yokomo, Tekin, Deans, Frewer, Hodr, Parma, Integy and Motor Saver
Dealer inquiries welcome

109 - 13060 80th Ave., Surrey, B.C. V3W 3B2 Canada

Tel: 604-543-9328 Fax: 604-543-8890

www.competition-rc.com

Email: crc@competition-rc.com



Please recycle your batteries.





Tech Racing **Voggerd GT**

by George M. Gonzalez



s p e c s

SCALE 1/10
LIST PRICE \$399.99

DIMENSIONS (chassis)
Wheelbase 10.2 in. (259mm)
Width (F/R) 7.25 in. (184mm)

WEIGHT
Gross, RTR 52.9 oz. (1,500g)

CHASSIS
Type Double-deck
Material Woven carbon fiber/duralumin

DRIVE TRAIN
Type Triple belt
Primary Pinion/spur gear
Drive axle Constant-velocity drive shafts
Differential(s) Ball (F/R)
Slipper clutch None
Bearings/bushings Bearings

SUSPENSION (F/R)
Type Lower A-arm/adjustable upper wishbone
Damping Aluminum-body coil-over shocks

WHEELS
Type One-piece plastic
Dimensions (DxW) 2x1 in.

TIRES
Not included

ELECTRICS
Not included



A short time ago, Tech Racing* entered the U.S. touring-car market with the Voggerd T-10 touring-car—a tuned-down version of their top-of-the-line Voggerd T-10 RS that is sold in Japan. The T-10 featured a fiberglass chassis, dogbones and bushings and is priced to compete with the other bushing-equipped touring cars that are available in the States.

Even though the T-10 is priced competitively, its high degree of adjustability puts it in a league of its own; it is far too complex for many first-time racers. Now Tech Racing has released the Voggerd GT, which includes most of the RS's hot racing features and is clearly aimed at the high end of the R/C spectrum; the new car's adjustability and features should make it a good match for the needs of the more experienced hobbyist.

Will the GT find a place in the crowded American touring-car market? Only time will tell. In the meantime, take a ride with me to So Cal Raceway in Huntington Beach, CA, to see how the GT performs on a tight, indoor roadcourse.

An alternative pro tourer



The Speed Max Honda NSX body used during the photo shoot was custom-painted by Scott Bich of Bich'n Bodies*. Scott was inspired by a Mike Ogle paint job he saw in R/C Car Action many years ago and painted the NSX the same way as a tribute.

ALLOY FRONT AND REAR BULKHEADS

The GT includes lightweight and rigid duralumin front and rear bulkheads and shock-tower standoffs. These are usually expensive upgrades on other cars. The alloy components strengthen the GT's chassis and suspension.

WHEELS AND TIRES

The GT includes some wild-looking, neon-orange 3-spoke wheels but does not come with tires. I used Pit Shimizu* D98J L-P belted radials (shown) during the parking lot testing.

FRONT BUMPER

The optional Tech Racing foam front bumper shown here is a worthwhile upgrade.

ALLOY SHOCKS

The GT's improved sleeveless shocks are smoother and more consistent than the T-10's but they still require careful building and optional internal diaphragms to work consistently. On a positive note, I like the fact that you can adjust the shock's length by tightening or loosening the ball cup that is threaded onto each shock cap.

THREE-BELT DRIVE TRAIN

Rather than using a more conventional dual-belt 4WD system, the GT uses three belts to transfer the power to the front and rear differentials. This allows the front and rear bulkheads and diffs (the drive train's heaviest components) to be centered on the chassis for improved weight distribution. Although a three-belt drive train can be just as efficient as a two-belt unit, the system on this particular car is definitely more suited to modified-motor use because, in this application, the three-belt unit does produce marginally more friction.

GRAPHITE SHOCK TOWERS

The carbon-fiber front and rear shock towers are supported by duralumin standoffs to provide an ultra-rigid mounting platform for the shocks.

FRONT AND REAR BALL DIFFS

The super-smooth, adjustable ball diffs on both ends are easily adjusted without major disassembly.

UNIVERSAL DRIVE SHAFTS

The GT comes equipped with Tech Racing's version of MIP's popular constant-velocity drive shafts (CVDs). These units look and feel very much like the MIP CVDs, but they aren't hard coated. Tech Racing offers optional hardened drive shafts, but I found that the stock units work very well; just use plenty of thread-lock on the retaining grub screws.

GRAPHITE CHASSIS

The GT's double-deck graphite chassis is more rigid and more than 1 ounce lighter than the GT's stock fiberglass chassis. The GT's chassis is designed to use saddle-pack batteries, and it places the cells close to the chassis' centerline to improve weight distribution. Space for electronics is limited, however, and that is a problem with many touring-car designs. A small receiver will come in handy, and the Tekin TFM 75 FM receiver nicely fits the bill.

PRO SUSPENSION

The GT's suspension is highly adjustable. More important, the chassis is so sensitive that even the slightest changes will make a noticeable difference on the track. This is mostly because the upper and lower suspension arms pivot on pillow balls instead of hinge pins, and this allows the suspension arms to pivot virtually friction-free. Your caster choices will depend on how you mount the adjustable upper wishbones. Up front, there are three caster choices (0, 4, or 8 degrees); in the rear, you can have 4 degrees or none. Camber and toe-in/out are also adjustable at both ends of the car. Additionally, you can adjust roll center in the front and rear by installing washers underneath the lower pillow balls that secure the lower suspension arms.

TEST GEAR

• Airtronics* M8 transmitter • Futaba* S3401 servo • Tekin G-10 ESC • Tekin TFM 75 micro-receiver • Pro-Match* RC2000 6-cell saddle pack • Team Orion* 12-turn double Super Touring motor • Speed Max* D98J L-P belted radial • Yokomo Sprint tires (firm in the front and medium in the rear) • Yokomo 5-spoke Inch Up wheels and firm foam inserts • Speed Max Honda NSX body • Andy's Stratus body • Dan's R/C Stuff* saddle-pack battery straps

YOU'LL NEED

- Body.
- 2-channel radio and receiver.
- Steering servo.
- ESC.
- Motor.
- 6-cell saddle pack.
- Tires and CA glue.
- Strapping tape or battery straps.
- Intermediate to advanced modeling skills.

FACTORY OPTIONS

- Heavy-duty universal joint drive shafts (F/R)—part no. VS-36F/VS-36R.
- Special urethane bumper—VS-14.
- Graphite upper deck (F/R)—VS-17/VS-18.
- Adjustable tie rods (F/R)—VS-2/VS-3.
- Aluminum screw set—VS-38.
- Aluminum 3x7.5mm flat-head screw set—VS-39.
- Upper arm balls (6 blue)—VS-30.
- Lower arm balls (6 silver)—VS-31.
- Idler one-way clutch—VS-12.
- Super-active limiter (one-way front diff)—VS-13.

PERFORMANCE

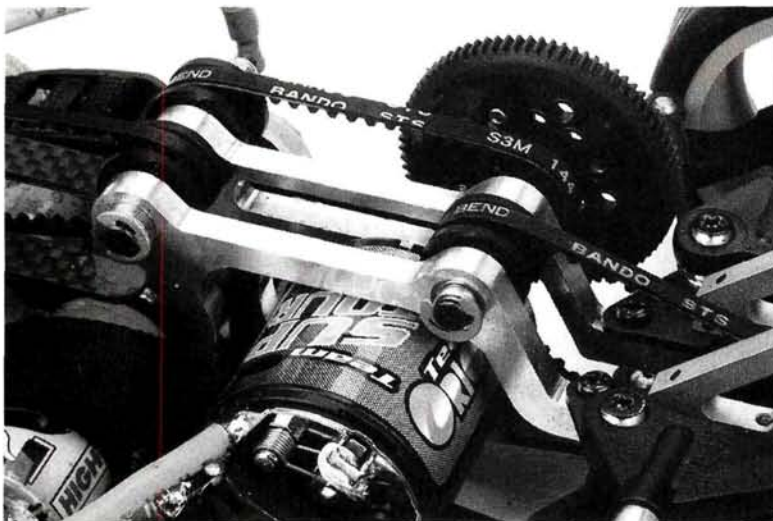
So Cal Raceway is a tight, indoor, on-road track; I'm used to it and have a good idea of which tires and bodies work best there. For this reason, I installed a complete set of Yokomo* Sprint tires (firm compound up front and medium in the rear); 5-spoke Inch Up wheels and firm foam inserts. I also slapped on an Andy's* Stratus body, which provides the perfect blend of front and rear downforce.

The GT didn't even complete a single lap before I encountered the first problem. All four universal drive shafts came apart, and the car stopped dead in its tracks. Fortunately, none of the drive pins or grub screws was thrown from the GT as it came to a sudden halt. I went back

to the pits, applied liquid thread-lock to all the grub screws and then went back out for another run.

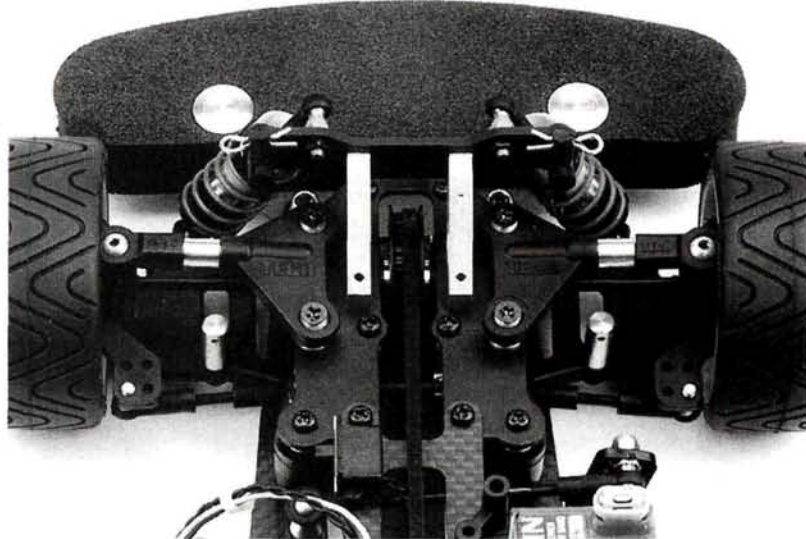
The second trip around the track proved to be more successful, and the car felt pretty dialed, although not for long. A couple of minutes into the battery pack, I noticed an inconsistency in the car's handling. It pushed to the right and hooked to the left and then, on the very next lap, it hooked to the right and pushed to the left. A very strange ailment indeed!

The moment I removed the body, I found the cause of the problem. Several of the machine screws that secure the pillow balls to the chassis and steering knuckles had come loose and were hanging on by



Above: with the front wheel removed, the pivot-ball-supported lower suspension arm and universal drive shaft are visible. In the event of a crash, the aluminum post on the suspension arm prevents the steering knuckle from traveling across the arm and into the drive shaft.

Above: notice the alloy motor mount and bulkhead—this is a very expensive upgrade on other vehicles. By adding a third belt, the diffs and bulkheads can be centered on the chassis to improve the weight distribution. Right: notice that the batteries are mounted as close to the center as possible. This gives the car more steering than you can handle. You'll need a radio with steering dual rate to limit servo throw.



Is this a trick front end or what? Graphite shock tower, aluminum-body shocks, universal drive shafts, alloy bulkhead—all standard. Notice the centered diff and adjustable upper wishbones that pivot on pillow balls. The optional foam bumper is available from Tech Racing.

BUILDING & SETUP TIPS

The Voggerd GT is an extremely complex piece of R/C machinery that requires precision assembly. It's also highly adjustable, so wrenching skills are a must. The step-by-step instructions are excellent and include many illustrations, but little supporting text. For these reasons, I would not recommend the GT to a first-time racer. Experienced racers, on the other hand, shouldn't have many problems building the kit and will appreciate the car's many racing features. Here are a few tips to help you get your GT dialed in a hurry.

■ **Hardware preparation.** Remove the grub screws that secure the drive pins on the universal drive shafts, and apply a couple of drops of liquid thread-lock to the threads, and re-install the screws. Apply thread-lock to every machine screw and nut that secures a pillow ball—a total of 16. Don't miss a single one.

■ **Shocks.** When installing the two O-ring seals inside the bottom end of the shock bodies, do not install the plastic shock-shaft guides in front of the O-rings as indicated in the instructions. Once the shock seal cap has been threaded onto the shock body, the plastic guide compresses

the O-rings, and that causes unnecessary friction. The shocks will work smoothly and won't leak if you omit the plastic shock guides; trust me. For super-smooth action and more consistent operation, I recommend that you install rubber bladders (diaphragms) in the shocks. The shock bladders that Tamiya includes with its kits work perfectly.

■ **Shock oil.** Lighter shock oils seem to work better because of the shock piston's single, small-diameter, valve hole. A good starting point would be 40WT oil in the front shocks and 30 to 35WT in the rear.

■ **Camber-rod sleeves.** The kit includes aluminum sleeves that slide over the threaded camber rods. The sleeves are not necessary, but their installation ensures that each wheel has 1.5 degrees of negative camber, which is just about perfect for most tracks.

■ **Caster and anti-squat.** Front caster and rear anti-squat adjustment is possible depending on how you install the upper wishbones to the upper deck. Because each arm can be adjusted independently, make sure that the pillow balls are installed in the same mounting positions on each side of the car.

■ **Rear toe-in.** This can be adjusted by varying the length of the rear toe links. Both must be exactly the same length, or one wheel will have more or less toe-in than the other. A perfect starting point is 1.5 degrees of toe-in on each wheel. To achieve this, each tie rod should be 52mm long. For slippery tracks, try increasing rear toe-in; on high-bite tracks, use a little less.

only a few threads. Again, I applied liquid thread-lock to all the screws and hit the track. This time, I was able to finish the battery pack, and the car was on its way to becoming dialed.

I made a few adjustments to the chassis and installed 2mm internal spacers in the shocks to lower it, and I filled the shocks with 40WT oil in the front and 35WT in the rear. I also lowered the body as far as it could go before hitting the track. From that point on, it held together and I was able to lay down some extremely fast laps.

I've raced the GT on many occasions since, and it's an excellent performer. I haven't bent or broken a single part, and that's testimony to the car's rugged design.



Likes

- High-tech chassis and suspension design.
- Highly tunable suspension.
- Centered drive train.
- Lots of alloy components.
- Excellent handling; designed for racing.
- Extremely rugged.



dislikes

- Complexity may confuse less experienced builders.
- Shocks require aftermarket parts to work consistently.
- Chassis has only limited room for electronics.

FINAL THOUGHTS

The Tech Racing Voggerd GT, although not for beginners, is a purebred racing machine. The GT is one of the most adjustable cars available and, more important, because of its extremely sensitive chassis, the GT is a great trainer to use to build your tuning skills. At the track, the GT is capable of running alongside the best, but you'll need tuning skills and plenty of practice in order to get the GT dialed. If you're looking to buy an expert-level touring car and your hobby shop supports the Tech Racing product line, the GT should be at the top of your must-see list.

*Addresses are listed alphabetically in the Index of Manufacturers on page 273. ■

THE COMPETITION

	Team Losi STREET WEAPON	Yokomo YR4M2 USA	Tech Racing VOGGERD GT	HPI RS4 PRO	Schumacher SST 2000 '98	OFNA Z10 PRO	Roadrunner XPRESS PRO
Wheelbase	10.19 in. (259mm)	9.94 in. (252mm)	10.2 in. (260mm)	10 in. (254mm)	10 in. (254mm)	10.15 in. (258mm)	10.25 in. (260mm)
Width	7.25 in. (184mm)	7.19 in. (182mm)	7.25 in. (184mm)	7.25 in. (184mm)	7.25 in. (184mm)	7.48 in. (190mm)	7.4 in. (188mm)
Diff type	Adjust. ball	Ball	Ball	Ball	Ball	Ball	Ball
Chassis	Composite	Graphite	Graphite	Graphite	Fiberglass	Graphite	Graphite
List price	\$349	\$380	\$399	\$329	\$369	\$380	\$450
Available at*	\$225	\$229	\$259	\$260	\$225	\$215	\$289
Reviewed in	12/97	11/98	1/99	10/97	12/96	4/97	4/97

*Prices vary with on location

Coming Soon!

Radio Control

CAR ACTION 1999

BUYERS' GUIDE

Look for it at your local hobby shop

FIRST LOOK!

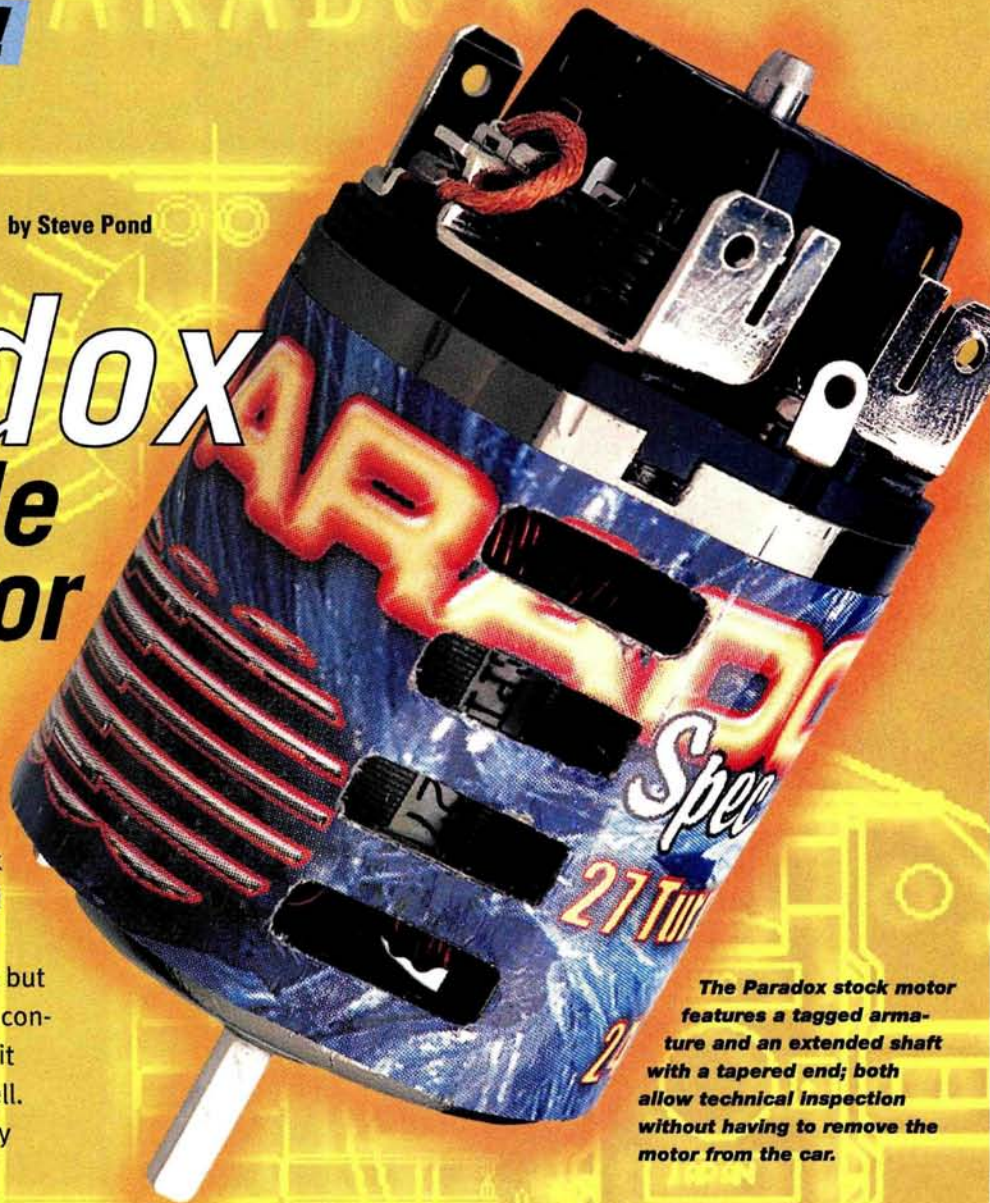
Trinity Paradox

rebuildable
stock motor

by Steve Pond

Trinity* is well-known for its motor-design innovations and the controversy that usually accompanies them. The company's latest release—the Paradox stock motor—screams of both because its end bell is removable, and it's the first stock motor that's built to ROAR specifications but can be dismantled for maintenance. The controversy? Current ROAR rules don't permit stock motors to have a removable endbell. Kind of makes the "Paradox" name pretty appropriate, don't ya think

The Paradox brush springs are both on the same side of the endbell. Large openings in the endbell and motor can make it easier to verify that bushings are being used.

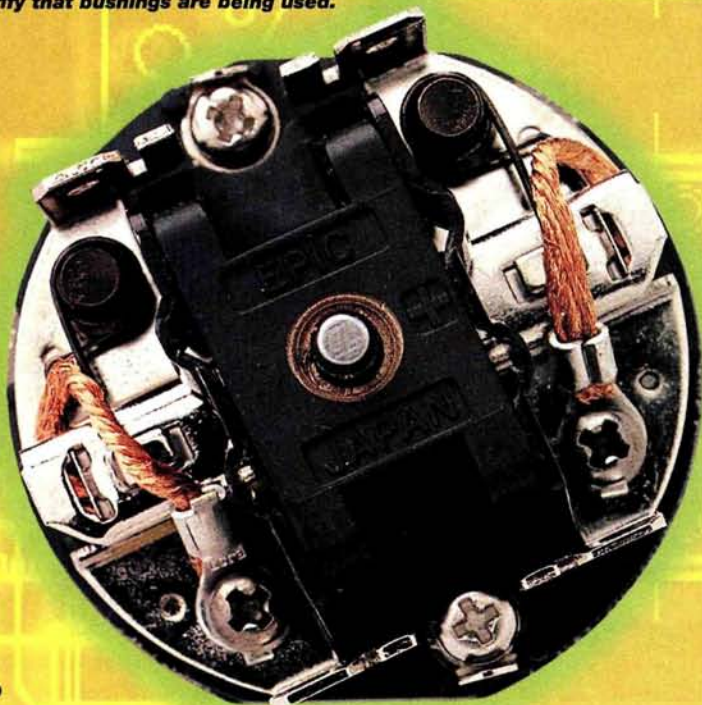


The Paradox stock motor features a tagged armature and an extended shaft with a tapered end; both allow technical inspection without having to remove the motor from the car.

THE MOTOR

The Paradox design is based on Trinity's Midnight 2 ROAR-legal stock motor. According to Trinity, the Midnight 2 was originally designed to have a removable endbell, but design complexities compelled Trinity to release the Midnight 2 with a fixed endbell. The primary difference between the two is that the Paradox has a locking ring in the can. This ring is similar to a modified-motor timing ring, and it's what allows the endbell to be removed from the can.

The Paradox can features flat sides and the latest wet-press magnets. The can's flat sides make it virtually impossible to rotate the endbell to increase timing and improve performance. A notch in the can that's indexed to the endbell further ensures that the timing can't be altered (it's set at 24 degrees to comply with current ROAR stock-motor rules). The can also features vents designed primarily to keep the motor cool. They also act as "windows" that inspectors can look through to verify that the proper armature is being used.



The Paradox and Midnight 2 endbells are similar but not interchangeable because the Paradox endbell is shorter to accommodate the locking ring, and it has been reconfigured to place both brush springs on the same side of the endbell. This makes the springs more accessible while the motor is

are already using.

The Paradox armature is the same as the Midnight 2's. It's a double-rotor design that is wrapped with 27 turns of 22-gauge wire—again in accordance with ROAR rules. The armature's unique characteristics are its special shaft and identifying tag. The motor shaft is

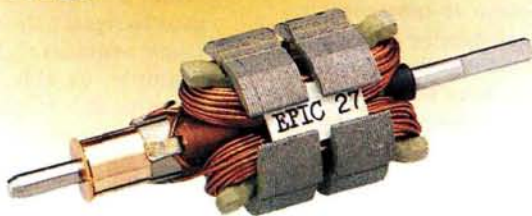
For a stock motor, the most obvious benefit of having a removable endbell is that it can be disassembled for maintenance.

in a car and offers a minute improvement in conductivity when both speed-control wires are soldered to the tabs on the same side of the endbell.

One of the brush springs is

The endbell locking ring in the motor can is what makes the endbell removable, and it's one of the features that prevent timing from being adjusted. The Paradox armatures feature a highly visible identification tag.

visibly longer on the endbell side to make it easier to verify that the correct armature is being used. The end of the shaft has a distinguishing taper that makes it easier to check the motor at a glance. The



coiled in reverse, so if you ever have to replace them, you'll need a special, non-standard spring. This won't be a problem as long as hobby shops stock them, and they'll be available when the motor is released. Starting with the release of the Paradox, all of Trinity's brush springs (including those for the Paradox) will use the pseudo-standard color coding. Instead of the old gold, silver and black that we are used to seeing, Trinity will use the blues, reds, purples, etc., that other brush manufacturers

armature also features a tag that's epoxied into place to make motor tampering easier to detect.

For a stock motor, the most obvious benefit of having a removable endbell is that it can be disassembled for maintenance. The commutator can be trued on a modified comm lathe that provides a much cleaner, truer cut than a stock lathe and should result in slight performance improvements. If this becomes standard, hobby shops and serious racers will no longer need to have both a stock comm

PROVETTI ON THE PARADOX



We asked Trinity's president, Ernie Provetti, about this innovative new motor.

R/C Car Action: The Midnight 2 Motor has been very successful. Why would you gamble with the Paradox?

Ernie Provetti: Trinity has set and wants to continue to set the trends in R/C. We want to hold on to our leadership position. People have so many outside family costs, and R/C products are introduced every week, and their prices continuously rise. We feel people should be able to enjoy their hobby and be able to afford it. Stock racing is supposed to be the entry-level class, but over the years, it has become one of the most expensive classes to compete in. We hope the Paradox will change this!

RCCA: How do you think the Paradox will do this?

EP: Well, the current ROAR stock motor rules were written roughly 25 years ago. ROAR did a great job, but times change. We've had a lot of requests on our website for a rebuildable stock motor. Customers say they're tired of buying 10 to 12 motors to find that "killer" one; and that "killer" motor eventually wears out—either the commutator or the bushings—and the whole crazy process starts again. With the Paradox, customers can just buy the part they need; they'll be in tune with the product they invested in.

RCCA: How would you respond to those who might say a rebuildable motor encourages cheating at races?

EP: Ironically, we feel the Paradox will limit cheating. Under the current ROAR rules [for closed-endbell motors], a track owner or tech inspector only has the "ROAR" stamp on the motor can to inspect—nothing else. With the Paradox, you have the armature tag and a longer armature shaft with a distinguishing bevel at the end. Also, it's easy to open and check it, and cheaters will be less inclined to try to get away with something if they know it can easily be found out! Most track owners don't tear down stock motors. Some don't know how, and for those who do, it takes too long. If it turns out a motor is legal and the track owner has "destroyed" it, he has to give its owner a new motor [\$40]. It does not take long to disassemble the Paradox, and you don't have to tear down the armature because of the special shaft and tag. Even if you did, you'd only have to give the customer a new armature—not a whole motor.

RCCA: How will the Paradox reduce the cost of stock racing?

EP: Well, to start with, you can buy a replacement armature for a list price of \$12.99—anywhere from \$10.50 to \$9 street price. You can also buy separate motor cans, Oilite bushings, etc. The big key is that the Paradox will run no quicker than a Midnight 2, so it does not make the current stock motors obsolete. The Paradox should be allowed to race with other ROAR-legal motors. Buy a Paradox when you want and then save money—we believe—on

PROVETTI ON THE PARADOX

buying parts instead of complete motors. Look at it this way: if a shock broke on your car, would you want to buy a totally new car? Sounds stupid, doesn't it? So why do you have to buy a new motor if your bushings wear out?

RCCA: What are ROAR's and NORRCA's reactions to the Paradox?

EP: Well, NORRCA openly embraces the idea and has for a long time been asking for a rebuildable motor; ROAR does not seem to be too excited about the Paradox. ROAR president Phil Hurd has said that the motor will not be legal, but we have received very positive feedback from several of the other executive committee members, so we will have to wait and see.

RCCA: Do you have anything you'd like to say to ROAR?

EP: I would just hope they accept the idea and keep an open mind. Trinity and ROAR should make the concerns of racers the basis of all our decisions. We have built a motor to the *exact* ROAR specifications and have made it cheaper and easier to use. I think this deserves at least some consideration.

RCCA: Many say they worry about "added costs"—specifically, epoxy-balanced armatures, matched magnets, etc. How would you answer these concerns?

EP: As I have said, we built this motor to ROAR rules and specifications. In my opinion, ROAR and NORRCA can easily stop those added costs by legalizing this motor and changing the current ROAR rules to include it—which is what we genuinely intended for it. ROAR doesn't allow welded commutators, epoxy-balancing, etc. Why would they allow them with the Paradox? Trinity will very soon offer a small booklet for hobby shop owners and track owners that talks about how to check the Paradox and what is legal and what is not. It will be available very soon!

RCCA: Who came up with the idea behind the Paradox?

EP: Actually, the "Tech Talk" readers on our website. They proposed the idea over a year ago and gave us a lot of great ideas and pro's and cons. From there, Tony P. and Mike Wood at Trinity spent countless hours designing the Paradox with our motor company in Japan. I think they came up with a concept that is even more revolutionary than the Midnight 2. I just hope that this motor will help change the way stock racing is regarded in this country and around the world.

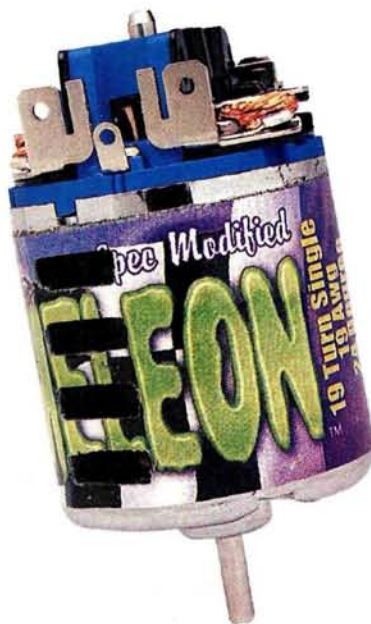
RCCA: What can we expect from Trinity in the future?

EP: We will probably start a rebuildable street spec motor project and also try to enlist more manufacturers to join this class. We will try to stay focused on cost-controlled options for our customers and do what we can to bring out more exciting products at affordable prices.

RCCA: Thank you for your time, and good luck with the Paradox!

lathe and a mod lathe because the stock armature can be removed from the motor.

So what happens if one of the Paradox's components is damaged or wears out? They'll all be available separately, so, for example, if the comm has been cut so many times that the armature is no longer usable, you simply buy a new armature for somewhere around \$12 (instead of buying a new motor for \$40). The same goes for the motor can; if its magnets lose their strength over time, it can be replaced for somewhere around \$12.



The Chameleon 19-turn, spec modified, ball-bearing motor is a spin-off of the Paradox design. It, too, features fixed timing, a tagged armature and a longer armature shaft.

RADICAL RAMIFICATIONS?

How will the introduction of a stock motor with a removable endbell affect the hobby? For consumers, I think it's a positive move: a stock motor that may easily be maintained will last longer, and it's cheaper to buy individual components than an entire motor.

For the racing set, there are some concerns: will a stock motor with a removable endbell allow cheating? There has been much speculation about this, and concern about cheating is why we have fixed endbells. I think it will *reduce* cheating. Let me explain: a number of stock-class "lifers" are very adept at

removing the "fixed" endbells on current stock motors; they make modifications and reinstall the endbell without leaving any sign that the motor has been altered.

At most tracks, there is very little technical inspection because it would destroy motors (the armature wire would have to be removed to verify that it's the proper 27 turns of 22-gauge wire). It's very time-consuming and expensive for the track operators to inspect even the suspect motors, so they often don't do it at all.

The Paradox doesn't have to be disassembled to be inspected. Its extended, tapered motor shaft is clearly visible even when the motor is installed in a car. The tag on the armature may be checked through the vents in the motor can (in certain types of vehicles, the motor may have to be removed for this inspection). To verify that the timing hasn't been altered, officials can check the perfectly aligned marks on the can and the endbell. If the timing has been changed, a look at these marks will make it very obvious because they will no longer be perfectly aligned.

If a full inspection is necessary, the armature can be removed from the can and stripped of its wire. Even if the inspection has to be taken this far (and in most cases, it shouldn't), a new armature costs far less than an entire motor.

Other concerns for the racing community involve factors that aren't covered by current rules. Could a hand-wound armature be used to replace the machine-wound stock armature? Might you, for example, be able to use a Reedy armature in a Trinity can? Now that motor components may be replaced individually, will cost controls be established for motor parts as well as for the whole motor?

In the final analysis, a stock motor with a removable endbell can be positive for consumers, track operators and hobby shop owners. If the race-sanctioning organizations institute rules that prevent additional costs from being introduced in the name of performance, there is a very good chance that running or racing a stock-class motor will look a lot more attractive.

**Addresses are listed alphabetically in the Index of Manufacturers on page 273. ■*



FSR BULLET SPORT



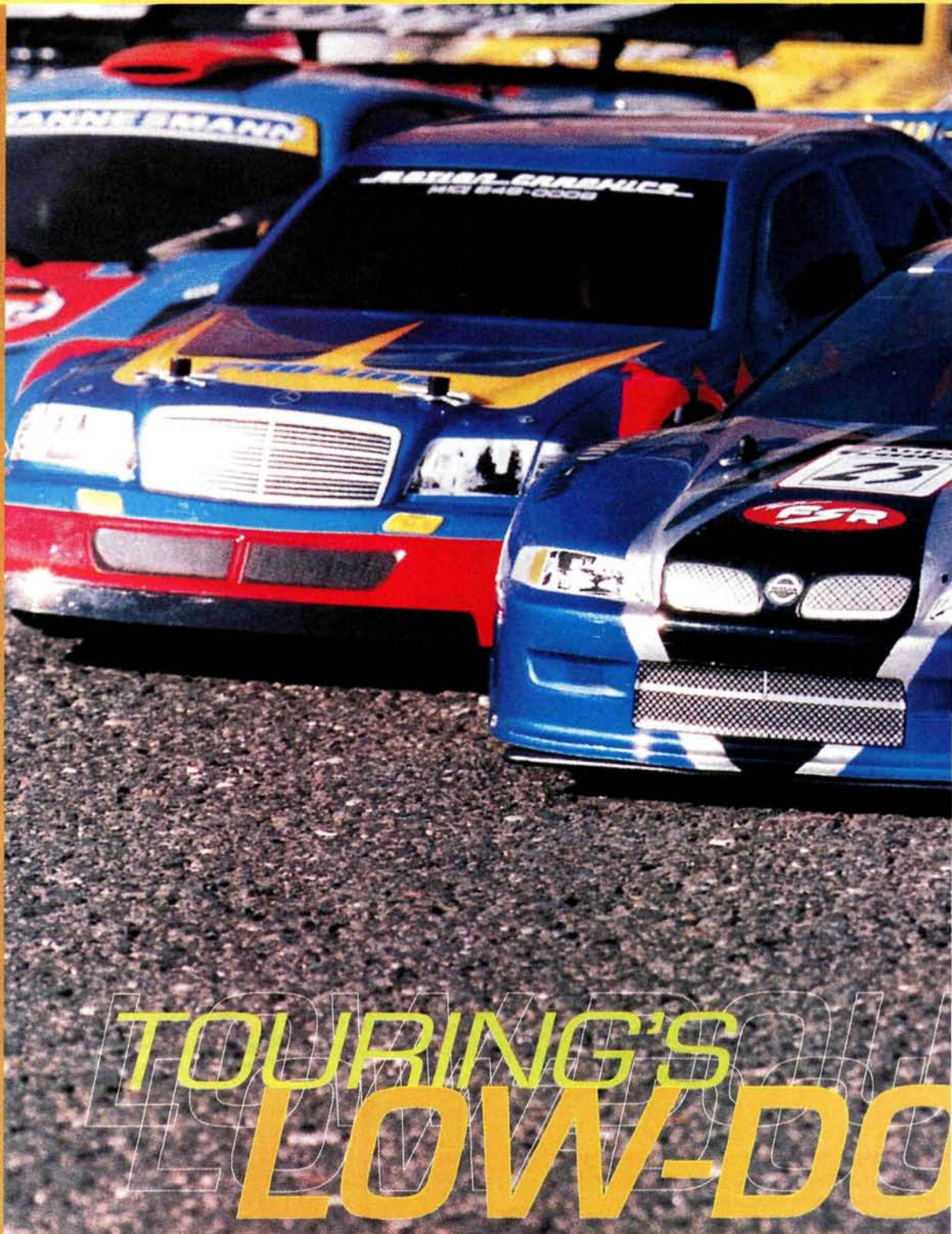
GHI ROADRUNNER XPRESS JUNIOR



HPI RS4 SPORT

4WD SPORT TOURING CAR

Here's the upside: if you're looking to get into touring cars on a budget, there are now more choices out there than ever. And now the downside: man, how are you ever gonna choose? Don't worry. Knowledge is power, and we're going to take you to school. We have assembled (literally) all the currently available "sport" touring cars on the market—12 in all. We measured, poked and prodded the dirty dozen to discover their strengths and weaknesses, and we took them to our favorite parking lots to swap transmitters and performance notes. After a lot of batteries, a whole bunch of transmitter time and a few heated discussions, we arrived at what you see here: a comprehensive guide, complete with ratings, to the entire spectrum of sport touring cars. We guarantee you'll find a favorite.



TOURING'S LOW-DO

SCHUMACHER SST 2000



TAMIYA TL01



TAMIYA TA03F





KYOSHO TF-3

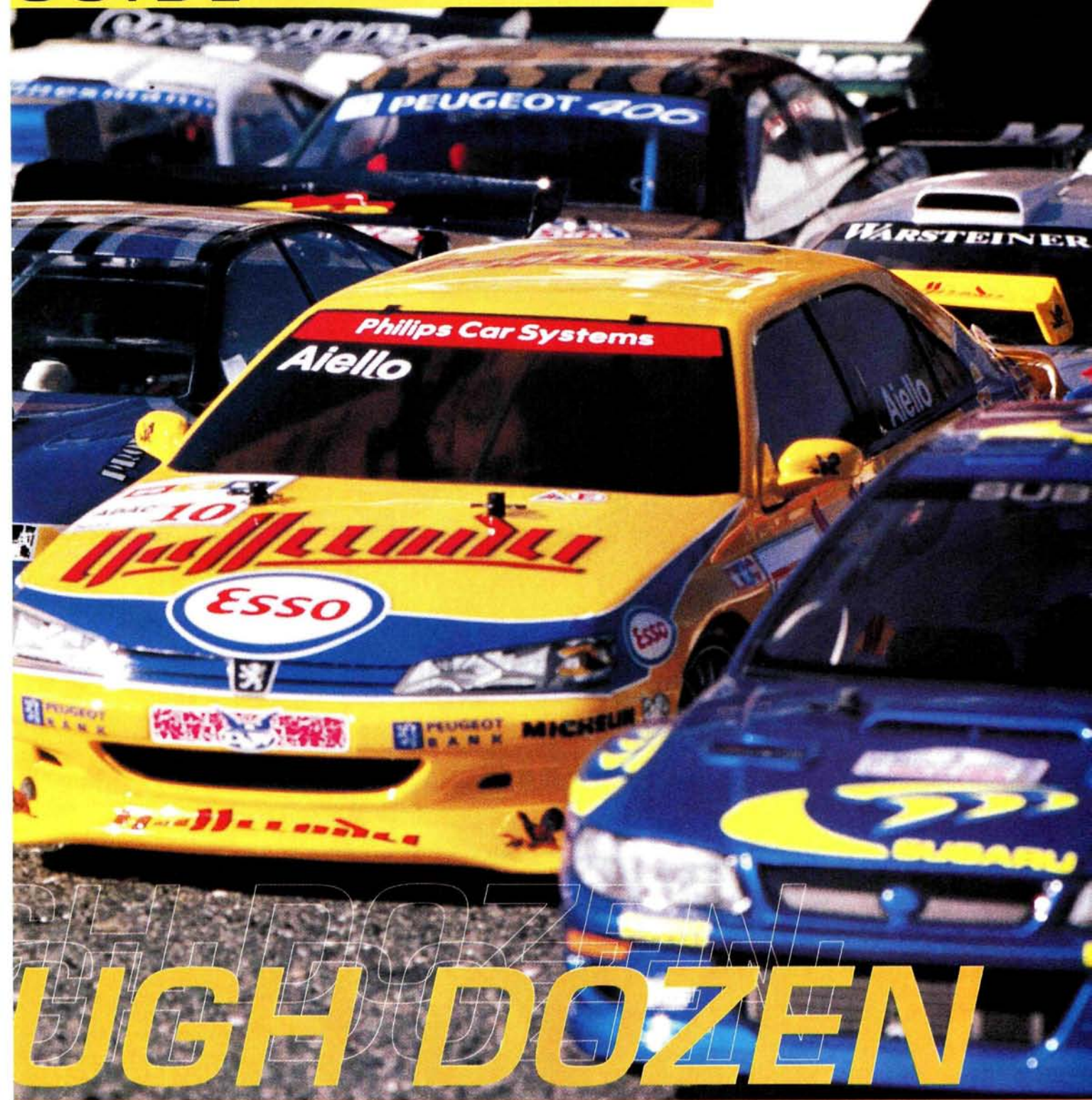


KYOSHO EP SPIDER



OFNA Z10 STOCK

GUIDE by the staff of *R/C Car Action*



ROUGH DOZEN



TAMIYA TA03R



TENTH TECH STREETWISE



TRAXXAS 4-TEC

FSR BULLET SPORT



PERFORMANCE

Driving the Bullet is just a matter of pointing it in the right direction. With stock motor power and sticky tires, the car simply does not break loose. The car can be tuned to provide any degree of understeer or oversteer you like, but the kit setup will push just slightly if you don't let off enough for sharp turns.

WHAT'S HOT

- Add hub bearings, and the Bullet Sport should essentially match the performance of the Pro version.
- Thick aluminum motor mount.
- Very high-quality parts.

WHAT'S NOT

- FSR should have gone all the way in the bearing department.

SUSPENSION/STEERING

FSR incorporates a suspension system that is most commonly seen on 1/8-scale on-road racers. Instead of hinge pins and hub carriers, the Bullet uses large-diameter pivot balls to permit suspension movement. The balls may be threaded into and out of the suspension arms to facilitate camber and rear toe adjustments, and the system operates with very little friction. Plastic shocks replace the Pro car's threaded, aluminum-body dampers. Although they cannot be adjusted as precisely, the plastic shocks work very well, and the included preload spacers permit adequate adjustability. The steering servo is joined directly to the front hubs via a kit-supplied servo saver.

CHASSIS

The Bullet's multi-plane fiberglass chassis is precisely cut and the materials are very high quality. The main chassis plate is slotted for saddle packs, but a plastic tray is provided for stick packs. A thick aluminum motor plate stiffens the rear of the car, and a thick turnbuckle braces the layshaft and further strengthens the chassis.

DRIVE TRAIN

The Bullet is the only three-belt car in the mix. Short belts that drive the front and rear ball diffs are joined to a long center belt via jackshafts, and small ball-bearing pinch rollers prevent the main belt from skipping. Universals are included at both ends of the car, and ball bearings are used everywhere except the hubs. The drive train rolls easily and smoothly.

COMMENTS

The Bullet is beautifully finished and incorporates all of the Pro version's best features, including a unique floating rear body mount that carries the body's weight on the rear hubs, not on the chassis. Top-shelf Pro-Line* wheels and tires are also included for a potent handling package.

YOU'LL NEED

- Standard pit gear.
- Motor.
- ESC.
- Body.

GHI ROADRUNNER XPRESS JR.

CHASSIS

The Xpress is a fiberglass car with a two-piece upper deck. The main chassis plate is slotted for saddle packs, and a plastic tray is provided for use with stick packs. Aluminum standoffs join the chassis plates.

WHAT'S HOT

- Plenty of racing features: universals, bearings, ball diffs.
- How does it handle? Any way you want it to.

WHAT'S NOT

- Parts quality not on a par with other kits.
- Plastic motor plate.

COMMENTS

The Xpress Junior has the goods where it counts; the drive train and diffs (which are preassembled on the chassis) operate smoothly, and the included ball bearings and universals are nice upgrades. However, the car's parts are not as nicely finished as other kits', and less experienced hobbyists will yearn for clearer instructions.

SUSPENSION/STEERING

The Xpress has a unique suspension system. The slab-sided lower A-arms are not unusual, but the front camber-link system is. The turnbuckle links are joined to additional turnbuckles that reach back to the upper deck. By altering the length of these turnbuckles, the front caster settings can be precisely (and independently) set.

The Xpress features a vertically mounted servo, which eliminates the need for steering bellcranks. Plastic, threaded-body shocks provide damping and permit fine adjustment of spring preload.

PAINT BY MOTION GRAPHICS



PERFORMANCE

This is a racecar, pure and simple. Expect to dump a few packs before you get the car set up, as the infinitely adjustable front end is sensitive to small changes. Ultimately, the Xpress will handle in any way you like, but you will need chassis-tuning experience to dial it in.

DRIVE TRAIN

Plenty of racin' stuff here: dual belts, ball diffs and universal drive shafts at all corners. Ball bearings are used throughout, and everything spins as smoothly as one would expect. Bummer: the motor plate is plastic (at least, it's thick).

YOU'LL NEED

- Standard pit gear.
- Servo-saver.
- Shock oil.
- Motor.
- ESC.
- Body.

DRIVE TRAIN

Yokomo was the first to offer dual-belt drive in a touring car, but HPI can be thanked for establishing the system as the popular standard. The layshaft is held high, so the front belt can clear the battery pack on its way to the front gear diff, which has a twin in the rear of the car. The rear belt tension may be adjusted by selecting different positions for the cams in which the diff rides. Metal bushings are used throughout the car.

SUSPENSION/STEERING

Threaded upper links and tie rods allow camber and toe adjustments, and the Sport's A-arms feature two mounting options for the hubs; this allows the user to build the car "wide" (for 200mm shells such as the Ford F-150—included with our kit) or "narrow" (to accommodate 190mm bodies). Plastic, oil-filled shocks are supplied and feel as plush as the best shocks we've tried. Dual steering bellcranks incorporate an adjustable servo-saver.

CHASSIS

The RS4 Sport's fiberglass, double-deck chassis is well finished and incorporates HPI's familiar quick-release battery tray. Large, plastic nerf wings protect the rear suspension system, and thick aluminum standoffs brace the upper and lower decks.

COMMENTS

The Sport is a versatile, durable, adjustable car that is well supported by factory and aftermarket hop-ups that make it a car you can grow with.

Assembly is time-consuming but not difficult, and the parts are all of very high quality.

YOU'LL NEED

- Standard pit gear.
- Motor.
- ESC.



PERFORMANCE

The Spider delivers the solid handling typical of 4WD sedans. There's a slight tendency to understeer (a good thing), and the kit tires allow the car to drift through corners with a tap of the brakes. The kit motor is typical of 540-type powerplants and offers plenty of run time but low top speed.

DRIVE TRAIN

The Spider's dual-belt drive train features an aluminum motor plate that offers less flexing and better heat dissipation than a plastic mount. Bevel-gear differentials are used at both ends of the car.

YOU'LL NEED

- Standard pit gear.
- ESC.

CHASSIS

The old-school Spider is the only machine with an aluminum chassis. Although the shiny stuff is perfectly fine for a "sport" car, the non-countersunk holes on the bottom of the main chassis present many protruding screw heads to snag any pavement bumps and ripples.

HPI RS4 SPORT

PAINT BY MOTION GRAPHICS



PERFORMANCE

Our wide test car proved to be one of the most stable cars we tested, and the kit's treaded radials were a good choice for unprepared parking lots. The Sport is easily pitched sideways, but it recovers with the application of brake and throttle, or you can keep the power on and snake around turns easily. Plenty of adjustability is built into the car for tuning experiments, but the stock setup won't have you reaching for the wrenches in a hurry.

WHAT'S HOT

- Popular car; virtually no limit to hop-up potential.
- High-quality parts.
- Fully adjustable.

WHAT'S NOT

- The Sport is time-consuming to build (but not difficult).

KYOSHO EP SPIDER

SUSPENSION/STEERING

The Spider's plastic-body, oil-filled shocks perform smoothly. Bladders are used for volume compensation, and nicely anodized blue shock caps add a bit of color. The well-braced A-arms at each corner of the chassis allow three shock-mounting options, and non-adjustable molded camber links complete the system. The dual-steering bellcranks do not use a servo-saver, but one is incorporated into the kit-supplied servo horn.

COMMENTS

A molded rollover hoop carried over from the nitro version of the Spider is an unusual feature for an electric car, but it's a handy place to zip-tie the wires away from the belts. The Spider's flexible battery tray is arguably the easiest to operate, and it does not rely on removable (read: "lose-able") clips or straps. Parts quality is good, and assembly was glitch-free. A great-looking scale body complements the chassis.

WHAT'S HOT

- It may be old-tech, but that aluminum chassis sure looks cool.
- Predictable handling.
- Great-looking Calibra body.

WHAT'S NOT

- Screw holes on chassis underside are not countersunk.

KYOSHO TF-3



CHASSIS

Kyosho's latest Touring Force design repositions the steering servo (now perpendicular to the chassis' centerline instead of parallel with it) and utilizes high-quality fiberglass plate for the upper and lower decks. The kit's racing intentions are announced by the built-in transponder mount behind the battery—sweet.

PERFORMANCE

Lighter and more efficient than its aluminum stablemate, the TF3 delivered rousing performance, although it would benefit from stickier tires. That's strictly racin' stuff, however; if drifting through turns sprint-car style is your idea of fun, stick with the kit rubber. Handling is neutral and predictable, but be warned: the laydown shock placement calls for the dampers to be carefully assembled; if they aren't of the same length, the car will tend to loop easily when turning in the direction of whichever side of the car has the shorter shock. Also, keep an eye on the outdrives; the setscrews that secure them tend to loosen.

DRIVE TRAIN

The TF3's dual-belt, gear-diff drive train is identical to the EP Spider's, but the revised servo placement eliminates the Spider's front belt standoff and its attendant drag. A full set of ball bearings further enhances the car's efficiency.

SUSPENSION/STEERING

The EP Spider's effective dampers also appear on the TF3, but they're in a much more "laid down" position, and low-profile fiberglass shock towers replace the Spider's tallish aluminum units. The suspension arms are new pieces, and threaded upper links facilitate camber adjustment.

The TF3 may be set up "narrow" (for use with 190mm body shells) or "wide" (200mm body shells); the required dogbones and camber-link parts for both versions are supplied. New steering bellcranks feature a built-in servo-saver to replace the Spider's servo-mounted unit.

COMMENTS

The supplied mini-bumper is racy but less effective than the Spider's wide shovel nose. Kyosho's easy-to-use battery tray is welcome, but slots for saddle packs would have been a nice second battery-mounting option for this highly raceable sedan platform. The TF-3 chassis can also be had with a body (such as the McLaren shown here) and Kyosho's excellent aluminum touring shocks for about \$30 more than the chassis-only kit we tested here.

WHAT'S HOT

- Tunable, raceable design.
- Built-in transponder mount.
- Includes parts for "wide" and "narrow" versions.

WHAT'S NOT

- Diff outdrives tend to loosen.

YOU'LL NEED

- Standard pit gear.
- Body (if purchasing "chassis-only" kit).
- Motor.
- ESC.

WHICH CAR IS RIGHT FOR YOU?

Finding the car that suits your needs and budget is what this guide is all about. Here are some points you should consider before you buy. See which heading describes you best, and dig in.

YOUR FIRST TOURING CAR IS ALSO YOUR FIRST R/C CAR

A good first-time building experience will surely hook you into the hobby in a big way. If you want to build your car from the ground up, the easiest kits to build are those from Tamiya*, particularly cars built on the TL01 platform. If you're young and not too sure of your building skills, the TL01 is all you need. Older, more experienced hobbyists can also enjoy the TL01 (we do), but it really shines as a first-time kit. Prebuilt vehicles also make it easy to get started, but we suggest you opt for a kit; that way, you'll know your car inside and out.

YOU'D LIKE TO TRY RACING

All cars in this guide can be hopped up with optional parts to handle competition, but some are closer to race-ready right out of the box than others. Bearings are probably the most critical upgrade to have; the Schumacher* SST, Kyosho* TF-3,

Xpress Junior, OFNA* Z-10 Stock and Tenth Technology* Streetwise are all fully equipped with the must-have friction fighters, and depending on the kit, include other niceties such as turnbuckles, slotted chassis and ball differentials. Put the FSR* Bullet Sport on your list as well, although you will need to add hub bearings. The bushed HPI* RS4 Sport should also be considered, since so many shops carry parts for it, and the car still costs less than \$200 ("street" price), even with the extra cost of bearings.

YOU WANT A CAR THAT LOOKS "REAL"

Tamiya and, to a lesser extent, Kyosho* own this segment of the hobby. Their bodies are beautifully detailed and feature many molded accessories such as windshield wipers, rearview mirrors, antennas and more. HPI has also been coming on strong lately with very scale bodies.

YOU'RE A HACK

We didn't break any of the cars during the tests, but experience has shown us that Tamiya cars, the HPI RS4 Sport and the Traxxas*4-Tec are especially durable.

OFNA Z-10 STOCK

DRIVE TRAIN

Nothing unusual here; the Z10's dual belts follow the typical layout, but ball differentials are used instead of heavier gear units. The belt system is very free-running when saddle packs are used, but the additional roller and standoff that must be installed when using stick packs cause the belt to bind excessively. Bearings are used throughout the Z10, and universal drive shafts are up front.

WHAT'S HOT

- Skilled pre-assembly gets you on the track fast.
- Very smooth drive train—if you use saddle packs.
- Included Andy's Stratus body.
- Ball bearings, turnbuckles and front universals included.

WHAT'S NOT

- Kit springs are too soft (now fixed, says OFNA).
- Front belt binds when set up for stick packs.
- Plastic motor plate.
- Crummy kit tires.

CHASSIS

The Z10's fiberglass chassis is a conventional double-deck design and is suitably stiffened by the plastic motor mount and transmission housings. The lower deck is slotted for use with saddle packs. All the underside screws are countersunk, and a quick-release battery tray is provided for use with stick packs.

COMMENTS

The Z10 arrives almost ready to run; shock assembly and tire mounting are left undone. Overall quality is good, although the fiberglass pieces were (literally) rough around the edges. You'll want to jet-tison the kit's plastic-like tires before you hit the track.

SUSPENSION/STEERING

Instead of conventional camber links, turnbuckle-equipped upper wishbones are used front and rear with lower A-arms. Nicely finished natural-aluminum dampers grace all four corners, but the supplied springs were much too soft and lacked sufficient force to extend the shocks. OFNA sent revised springs that have replaced those we received with our kit. We are told that the new springs are shipping with all current Z10 kits.

Steering duties are handled by conventional bellcranks that are secured to the lower chassis deck.



PERFORMANCE

With decent tires in place (we used Pro-Line slicks), the OFNA handled aggressively but demanded a steady hand. The Z10 may lack the carbon fiber and machined-aluminum parts of the Pro version, but its design is essentially the same, and it shows on the track. If you have good driving skills, the Z10 will reward you with fast laps, but new drivers and those of us who just want to pound around will find it less forgiving than other cars. That said, the Z10 can easily be adjusted to suit your driving style via the included turnbuckles. Speed and run times improve when running saddle packs (which eliminate the need for the power-robbing belt standoff), and the car also becomes less twitchy when running saddles.

YOU'LL NEED

- Standard pit gear.
- Tires (included, but they really must be replaced).
- Motor.
- ESC.
- Body.

SCHUMACHER SST 2000



PERFORMANCE

The SST is a thoroughbred racer and can be bought with tuning springs and swaybars (but sans body) for the same price as the Peugeot-body car shown here. Highly adjustable, the SST can be made to handle in any way you like, but the stock setup is quite neutral and has no bad habits. The smooth drive train makes very efficient use of the motor and battery, and the car's light weight further contributes to its spirited feel.

CHASSIS

Six slots hold a saddle pack on the right side of the car, leaving the left side to the electrics. An included adapter allows stick packs to be used, and quick-release straps secure either type of battery. The SST is preassembled, but you will have to fill the shocks with the supplied oil and remove the tires to install the included foam inserts.

DRIVE TRAIN

The SST joins the ranks of the dual-belt cars and incorporates ball diffs front and rear.

Schumacher's unique "Blade" universals drive the wheels and take their name from a clever plastic yoke that wraps around the dogbone end of the universals to reduce outdrive friction and wear. Ball bearings are used throughout the SST, and the drive train is exceptionally smooth.

SUSPENSION/STEERING

Schumacher supplies its adjustable Vari-shock pistons in the kit's plastic-body shocks, which function well. The pistons allow the user to choose piston holes to control damping within the oil-filled shocks. The suspension layout is a conventional A-arm/camber-link setup, and turnbuckles are included for easy adjustment of front and rear camber and toe. The dual-steering bellcranks incorporate an adjustable servo-saver.

YOU'LL NEED

- Standard pit gear.
- ESC.
- Motor.
- Pinion.

WHAT'S HOT

- Highly adjustable chassis.
- Full bearings and universals included.
- Unique yet sensible design.

WHAT'S NOT

- Plastic motor plate.
- Unusual Pozi hardware.

COMMENTS

The SST 2000 is the most extensively prebuilt car of the bunch, and the factory assembly is well done. The kit tires are made of unusually thin, supple rubber, and they are backed by foam inserts. Overall quality is quite nice, and the rear toe adjustment is a welcome feature. For hassle-free maintenance, get the correct driver for the kit's Pozi-type screws. The right tool makes all the difference; a Phillips screwdriver will slip, but the Pozi tool grips as effectively as an Allen wrench.

TAMIYA TL01

DRIVE TRAIN

One of only two shaft-drive cars in our guide, the TL01 makes use of a thick steel drive shaft to deliver power to the front and rear gear diffs. The bevel-gear internals are proven tough, and the TL01's well-sealed drive train is essentially maintenance free. The motor is held just ahead of the diff and is mounted to the car in one of three preset positions, depending on pinion size. Just bolt the motor into the holes labeled for the pinion's tooth count, and voilà—perfect gear mesh.

WHAT'S HOT

- Simple and confidence-inspiring to build and drive.
- Practically maintenance free.
- Extremely durable.

WHAT'S NOT

- Non-adjustable suspension.

COMMENTS

There's a lot to be said for the simplicity of this car; it's a quick, easy build, and some of the trickier elements of R/C setup (gear mesh, proper shock bleeding) have been eliminated, which makes this an ideal "first kit" for the newcomer to R/C (especially younger modelers). No matter which TL01 kit you buy, you'll also get a stellar body set with accurate decals and trim pieces.

SUSPENSION/STEERING

The TL01 uses friction shocks to damp the car's fully independent suspension. Built carefully, the shocks are effective, if somewhat underdamped. The suspension arms are two-piece affairs and are matched with non-adjustable, molded upper links. Likewise, the steering links are one-piece units, so toe-in is factory set. The TL01 ties the steering hubs directly to the steering servo via an oversize servo-saver; no bellcranks are used.



PERFORMANCE

Like other 540-powered cars, the TL01 isn't a speed demon, but it does have pretty good squirt. Frankly, only speed-addled editors seem to think this and similarly powered cars are "slow"; the kids who gathered to watch the car in the *R/C Car Action* test lot thought it was fast. The TL01 goes where you point it with no surprises, but it can be slid through turns with a touch of brake. An excellent first car.

CHASSIS

The TL01's unique molded chassis is neither a tub nor a plate but rather a three-piece monocoque-style assembly with integral gearboxes and shock towers. Once screwed together, the chassis is suitably rigid and very durable.

YOU'LL NEED

- Standard pit gear.

WHAT IS A "SPORT" TOURING CAR?

Good question. Is a sport touring car (STC) one that falls below a certain price cap? Or is it any bushing-equipped car? Maybe only cars with non-adjustable chassis should be considered "sport" models? To settle the issue, we decided on this simple qualifier: any car that is not a manufacturer's top-of-the-line model is, by default, that company's "sport" model. To further narrow the field, we included only 4WD touring-car chassis and excluded 2WD platforms with touring-car bodies. Note, too, that this article is actually a touring *chassis* guide; for instance, the HPI RS4 Sport is no less a touring car for having an American pickup-truck shell.

That said, the STCs featured here reflect very different philosophies on just what corners should be cut to keep prices down. Some manufacturers omit a motor and speed control but include bearings; others supply bushings but splurge on highly detailed bodies and include some electrics. It's a tough call for the kit makers: are universal drive shafts more important than alloy shock bodies? Are threaded links OK, or must turnbuckles be included? You be the judge. With 12 cars vying for your attention, one is sure to be just what you're looking for.

WHAT ELSE DO I NEED?

All the cars featured here require additional items (which we like to call "standard pit gear") to get them up and running. These items are necessary to build and operate any kit; even the most "complete" kits require them.

STANDARD PIT GEAR

- 7.2V stick-type battery.
- Charger for 7.2V battery.
- 2-channel radio set with two "standard" servos, or one servo and an electronic speed control (ESC).
- Polycarbonate-compatible paint (for finishing the body).
- Cyanoacrylate (CA) glue, also known as "superglue." You'll need this to bond the tires to the rims.
- Assembly tools (requirements vary with kit).

SOME KITS MAY ALSO NEED

- Motor.
- Body.
- Pinion (the gear that is mounted on the motor).
- Oil for the shocks.
- Silicone grease or "diff lube."

Kits without these items are generally geared toward racers who prefer to select these items themselves to suit local race conditions.

If you plan to purchase everything you need in one shot, ask the dealer for a package discount. Many hobby shops sell specially priced car/radio/battery/charger combos that can save you a few bucks—leaving more cash for track time!

TENTH TECHNOLOGY **STREETWISE****PERFORMANCE**

Were it not for the Streetwise's unique sound, you would be hard-pressed to pick it out from the other sure-footed cars tested. Tap the brake to set up for a turn, and the rear end comes around. Countersteer, and the car drifts through sideways. Straighten the wheel, and the rear end snaps in behind the front. Conventional sedan handling from a highly unconventional chassis.

WHAT'S HOT

- Efficient shaft-drive system.
- Pre-assembled drive train.
- Unique design.

WHAT'S NOT

- Tight space for battery, electrics.
- Motor mount permits only two pinion choices.

TRAXXAS 4-TEC**CHASSIS**

There are other cars out there with molded chassis, but only Traxxas uses a molded plate chassis. The individual pieces are flexible, but the completed car is impressively rigid. We built our own test car, but Traxxas does offer a prebuilt version with radio.

WHAT'S HOT

- Very complete package: easy-to-adjust ball diffs, telescoping universals, dual-belt drive.
- Highly adjustable chassis.
- Fast kit motor.

WHAT'S NOT

- Plastic motor plate.

CHASSIS

The Streetwise's composite-plastic tub provides the hard points for the car's unique suspension components. The drive-train parts (including diffs) are already installed for you when you open the box—nice.

DRIVE TRAIN

It's radical departure time. A single graphite drive shaft dominates the chassis tub and spans the front and rear gearboxes. Bevel gears at each end of the shaft mate directly with the smoothly turning ball diffs. That's it. No counter-gears, no reduction gears—nuthin'. The kit-supplied 540 motor is mounted alongside the drive shaft via an aluminum ring; one of two holes in the ring is used, depending on the pinion size you wish to use (a 19- or 25-tooth will fit). Dogbones get the power out to the wheels, and everything spins on ball bearings.

SUSPENSION/STEERING

Threaded links allow the 4-Tec's camber and toe-in to be adjusted. Upper wishbones are used up front with carrier-less hubs, while straight links are in the rear. The front wishbones use spacers to adjust caster, and an optional zero-degree caster plate can be added for reactive caster. Well-supported dual steering bell-cranks point the tires, and a servo-saver is supplied. Plastic oil-damped shocks suspend the car.

DRIVE TRAIN

The 4-Tec is another dual-belted. Ball differentials are a welcome bonus, and they are factory-built to speed you through the assembly process. Telescoping universal drive shafts exit the diffs, and Traxxas saved you the trouble of installing the pivots in the yokes by doing it for you (cheer). Ball bearings support the layshaft; bushings are used elsewhere. The drive train is among the smoothest of the smooth, which means the included 20-turn motor should waste little energy on friction and put the juice where it counts—into the tires. It would be nice, however, if the motor were bolted to an aluminum motor plate, as plastic offers little in the way of heat dissipation.

SUSPENSION/STEERING

Inboard shocks are used front and rear. The front system uses large bell-cranks to transfer the up-and-down movement of the suspension arms to the plastic shocks, which are tucked behind the front gearbox. The rear shocks are simply stacked atop the rear suspension and are articulated by the upper wishbones without any extra moving parts. The front and rear shocks are heavily sprung to compensate for the systems' high leverage ratio. The car's unusual layout cannot accommodate bell-crank steering, so a long rod and clevis join the steering servo to the left front hub; another link joins the left hub to the right.

COMMENTS

The Streetwise is the most innovative car here, but the car does some things "the hard way"; case in point, the unusual suspension that functions well but not necessarily better than simpler, conventional systems. The drive train, on the other hand, is another story; it's a model of simplicity and efficiency—and durability, since there are no belts to foul. Space is tight for the battery and electrics, and we found that 1700 and 2000mAh packs didn't fit without rubbing the drive shaft (you knew 1700 and 2000s were larger than 1400 and 1500s, didn't you?).

YOU'LL NEED

- Standard pit gear.
- ESC.

**PERFORMANCE**

The 4-Tec was the fastest car we tested (of the kits supplied with motors) by virtue of its 20-turn mill. To be fair, any of the other cars would have been as fast if supplied with the same motor (and appropriate gearing), but only Traxxas gives you the hotter motor, so there. There's just a touch of push in the factory setup, but four-wheel-drift is easy to maintain, and the car is very responsive overall.

COMMENTS

Hey, Traxxas, we thought the 4-Tec was supposed to be an entry-level car! Ball diffs, universals, adjustable caster and camber Why didn't you go ahead and mold in a transponder mount?

YOU'LL NEED

- Standard pit gear.

SPECS	FSR BULLET SPORT	GHI XPRESS JR	HPI RS4 SPORT	KYOSHO EP SPIDER	KYOSHO TF-3	OFNA Z-10 STOCK	SCHUMACHER SST 2000
WHEELBASE	10.36 in. (259mm)	10.48 in. (262mm)	10.28 in. (257mm)	10.44 in. (261mm)	10.12 in. (253mm)	10.24 in. (256mm)	10.16 in. (254mm)
WIDTH (F/R)	7.52/7.6 in. (188/190mm)	7.4 in. (185mm)	7.8/7.9 in. (195/197mm)	7.8 in. (196mm)	7.8 in. (196mm)	7.48 in. (187mm)	7.28/7.8 in. (182/185mm)
WEIGHT (RTR)	52 oz. (1474g)	47.6 oz. (1,349g)	50.9 oz. (1,443g)	54.5 oz. (1,545g)	51.9 oz. (1,471g)	49.7 oz. (1,409g)	50.1 oz. (1,420g)
CHASSIS TYPE	Multi-piece upper/lower plate	Upper/lower plate	Upper/lower plate	Upper/lower plate	Upper/lower plate	Upper/lower plate	Upper/lower plate
MATERIAL	Fiberglass	Fiberglass	Fiberglass	Aluminum	Fiberglass	Fiberglass	Fiberglass
CAMBER LINKS	Adjustable ball	Turnbuckle	Threaded	Non-adjustable	Threaded	Turnbuckle	Turnbuckle
TIE RODS	Turnbuckle	Turnbuckle	Threaded	Non-adjustable	Threaded	Turnbuckle	Turnbuckle
SHOCKS	Plastic oil-filled	Plastic oil-filled	Plastic oil-filled	Plastic oil-filled	Plastic oil-filled	Aluminum oil-filled	Plastic oil-filled
DRIVE SHAFT (F/R)	Universals	Universals	Dogbones	Dogbones	Dogbones	Universals/dogbones	Plastic universals
4WD SYSTEM	3-belt	Dual belt	Dual belt	Dual belt	Dual belt	Dual belt	Dual belt
BEARINGS/BUSHINGS	Bearings w/bushed hubs	Bearings	Bushings	Bushings	Bearings	Bearings	Bearings
DIFFERENTIAL TYPE	Ball	Ball	Bevel gear	Bevel gear	Bevel gear	Ball	Ball
KIT SPEED CONTROL	—	—	—	—	—	—	—
MOTOR	—	—	—	Kyosho 540	—	—	—
LIST PRICE	\$299.99	\$220	\$219	\$199	\$249.99	\$199.95	\$369
AVAILABLE AT*	\$199 (estimated)	\$135	\$150	\$130	\$180	\$180	\$225

*Prices vary with location.

GLOSSARY OF TERMS

Just in case you're new to the hobby and your knowledge is a little sketchy on some of the technical terms and handling jargon, this should help (sketchy: uncertain, superficial, incomplete).

BALL DIFFERENTIAL (BALL DIFF)

This type of diff has individual steel balls pressed between steel drive plates (diff rings) to provide differential action (see "differential"). Ball diffs are lighter than gear diffs and provide smoother operation.

BELLCRANK

A pivoting arm that allows a force moving in one direction to be sent in another; most cars use bellcranks to convert backward-and-forward servo motion into side-to-side steering motion.

CAMBER, CAMBER LINKS

"Camber" refers to the angle of the wheels (as viewed from the front of the car, as though it were about to run you over). "Positive" camber means the wheels lean away from the chassis; "negative" camber means they lean toward the chassis. Camber links are lengthened or shortened to adjust the camber angle.

CASTER

Refers to the angle of the kingpins (the front hubs' pivots); the more they are angled toward the rear of the car, the more caster you have. Caster adds stability, but too much makes the car's handling feel numb. Not enough, and the car may be darting and unstable.

COMPOSITE

A catch-all term for plastics reinforced with bits of glass fiber or other non-plastic materials.

DIFFERENTIAL (DIFF)

Permits the car's wheels to turn at different speeds while cornering (the wheels on the inside of the turn rotate more slowly than those on the outside). The term comes from the role the diff plays; it allows both drive wheels to receive power even though there is a difference in speed or speed differential.

DAMPERS, DAMPING

Dampers are shock absorbers. Damping is the force required to move the piston through the oil in an oil-filled shock, or the force generated by whichever damping mechanism is used. Damping prevents the shocks' springs from making the car bounce like a pogo stick when it hits a bump.

GEAR DIFFERENTIAL

Uses gears (duh) to provide diff action. Although less smooth and precise than a ball diff, a gear diff needs zero maintenance and is nearly bomb-proof. See "differential."

TUNING OPTIONS

	NO. OF INNER CAMBER ROD POSITIONS (F/R)	NO. OF OUTER CAMBER ROD POSITIONS (F/R)	ADJ. FRONT CASTER	ADJ. ANTI-SQUAT	ADJ. REAR TOE	ADJ. WHEELBASE	ADJ. WIDTH	BATTERY POSITION	SADDLE-PACK ADAPTABLE
FSR BULLET SPORT	1	1	YES	NO	YES	NO	YES	1	YES
GHI EXPRESS JUNIOR	2/2	1/3	YES	NO	NO	NO	NO	1	YES
HPI RS4 SPORT	1	1/4	NO	NO	NO	NO	YES	2	NO
KYOSHO EP SPIDER	1	1	YES	NO	NO	YES	NO	1	NO
KYOSHO TF-3	1	1	YES	NO	NO	YES	YES	2	NO
OFNA RACING Z-10 STOCK	1	1/2	NO	NO	NO	NO	NO	1	YES
SCHUMACHER SST	1	1	NO	YES	YES	NO	NO	1	YES
TAMIYA TA03F	1	1	NO	NO	NO	NO	NO	1	NO
TAMIYA TA03R	1	1	NO	NO	NO	NO	NO	1	NO
TAMIYA TLO1	1	1	NO	NO	NO	NO	NO	1	NO
TENTH TECH STREETWISE	1	1/2	NO	NO	YES	NO	NO	1	NO
TRAXXAS 4-TEC	1/2	1/3	YES	NO	NO	NO	NO	1	NO

OVERSTEER

Also known as "hooking"; the rear wheels do not have enough traction, and the car tends to spin out or kick out its rear end in a turn. A car with oversteer is said to be "loose."

SADDLE PACK

A 6-cell battery assembled into two, 3-cell sets joined by a wire. They look like saddle bags, hence the term. Saddle packs are often used because they hold the weight of the cells closer to the chassis' centerline for better handling.

TIE RODS

Linkages that join the steering servo or steering bellcranks to the front hubs.

TURNBUCKLE

An R/C car uses fixed plastic links, threaded rods, or turnbuckles for its tie rods and camber links. Plastic units aren't adjustable; threaded rods may be adjusted, but dis-

assembly is required. Turnbuckles are the best, as they allow easy on-car adjustment of camber and toe-in.

UNDERSTEER

Also known as "push," which is what a car is said to have when the front wheels do not have enough traction to adequately turn the car. Instead, the wheels slide across the pavement as they are pushed by the rear wheels.

UNIVERSAL DRIVE SHAFTS (UNIVERSALS)

This type of drive axle uses a universal joint (U-joint) in one end to help smooth power delivery to the wheel. "Telescoping" universals have U-joints at each end joined by a sliding pair of sleeves that allow the drive axle to extend with the movement of the suspension.

WHEELBASE

The distance between a car's front and rear axles. The longer the wheelbase, the more stable a car tends to be.

ratings

COMPLETENESS
INSTRUCTIONS
EASE OF ASSEMBLY
MAINTENANCE
PERFORMANCE
QUALITY

SCORING NOTES

FSR BULLET SPORT	7	8	8	8	9	9	FSR really nailed this one. The Bullet Sport is a unique, high-performance car that can be adjusted for mild, novice-friendly handling or razor's edge performance.
GHI XPRESS JUNIOR	6	6	7	7	9	7	We'll gripe about some of the rough components, but all that's really important is this: the car works. If you've got some R/C experience under your belt and need a competitive racecar that's inexpensive, here it is.
HPI RS4 SPORT	8	8	8	8	9	9	HPI has been refining the RS4 line for a while now, and it shows in the Sport. The car scores solidly in all areas.
KYOSHO EP SPIDER	9	8.5	8	8	8	8	The EP Spider is showing some age, but it's still a good car. Some of the parts have more flashing than we'd like; otherwise, "quality" would be a solid 9.
KYOSHO TF-3	7	8.5	8	8	9	8.5	The TF3 outperforms the Spider, but builds almost identically and shares many of its parts—hence the similar scores.
OFNA RACING Z10 STOCK	8	6	9	8	8	7.5	The instructions aren't up to par, but the kit's relative simplicity and pre-assembly kept the "Ease of assembly" score high. Bump performance up to a "9" if you run a saddle pack and dump the kit tires.
SCHUMACHER SST	7.5	7.5	10	7	9	9	The instructions recycle material created for the first SST, so pics often don't match the actual car. Diff access required a fair amount of wrist exercise. But don't get fixated on the lower scores; the SST is an excellent racer with a lot of "bang for the buck."
TAMIYA TA03F	10	9.5	9	8	8	9.5	Both TA03 kits include motor, body, mechanical speed control and lubes—everything you need (minus the usual support gear) to get them running. Tamiya's instructions are the industry benchmark, and that earns them the highest marks.
TAMIYA TA03R	10	9.5	9	8	8	9.5	See TA03F comments.
TAMIYA TL01	10	9.5	9.5	7	7.5	9.5	Any transmission work requires major surgery, so "Maintenance" scores low, and the somewhat top-heavy chassis and friction shocks don't deliver the same agility as the other cars. But for the less experienced hobbyist or anyone who just wants to play, play, play, the TL01 might be the best of the bunch.
TENTH TECH STREETWISE	9	7	7.5	8	8.5	8	The Streetwise lost a "Maintenance" point due to poor diff access but still scores high because the drive train is well sealed; you shouldn't have to get in there very often. Instructions are adequate, but could be improved. Front suspension assembly is mildly frustrating.
TRAXXAS 4-TEC	10	9.5	9	8	9	8.5	We split on quality; the materials are right, but some thought the stamped outdrive yokes and slab-sided rear end were inelegant. If you value function over form, mentally kick the "quality" score up to a 9; the stuff works.

HOW WE RATED THEM

COMPLETENESS

Is everything you need in the box? We believe all sport tourers should include shock oil, motor, pinion, body, decals and some tools—at least a box wrench and a couple of Allen keys. No demerits if a speed control is not included, but we look favorably on those kits that include one.

INSTRUCTIONS

Clarity is everything; crisp illustrations, accurate parts key and concise text earn high marks.

EASE OF ASSEMBLY

Extensive hand-fitting, scattershot parts and "impossible" assembly steps are no longer acceptable in modern kits. A perfect "10" has logically bagged parts, goes together without a hitch and doesn't require microsurgery skills.

MAINTENANCE

The key questions here are: how often does it need maintenance and how easy is it to do? Easy parts access and long-lasting settings score high.

PERFORMANCE

Since we are testing "sport" cars, the performance numbers are influenced more by fun factor and ease-of-handling concerns than they are by hardcore racing performance.

QUALITY

This one can be a little nebulous. We're looking for well-molded plastic parts, cleanly cut fiberglass or graphite parts and good materials, but there's also that tough-to-quantify feeling of superior manufacturing.



WEDICO PETERBILT TRUCK

Reality rig

by Steve Pond

The R/C car market is filled with vehicles that range from entry level to highly sophisticated racing thoroughbreds, and most are designed to emulate full-scale vehicles (very loosely, in some cases). Non-racing vehicles tend to have a more scale look, but there seems to be an absence of what I call "super-scale" vehicles—kits that mirror their full-scale counterparts in almost every dimension. Sure, there are custom-built, true-to-scale, one-of-a-kind vehicles, but they're five-digit expensive and the work of the world's top talents! How can you and I—the people born with 10 thumbs—even get close to one of these custom pieces?

SCALE 1/16
LIST PRICE \$3,600 (approximate)

DIMENSIONS
Length overall 24.5 in. (622mm)
Wheelbase 19.25 in. (489mm)
Width overall 6.75 in. (171mm)

WEIGHT
Gross (as tested) 200 oz. (5,670g)

CHASSIS
Type Ladder
Material Aluminum

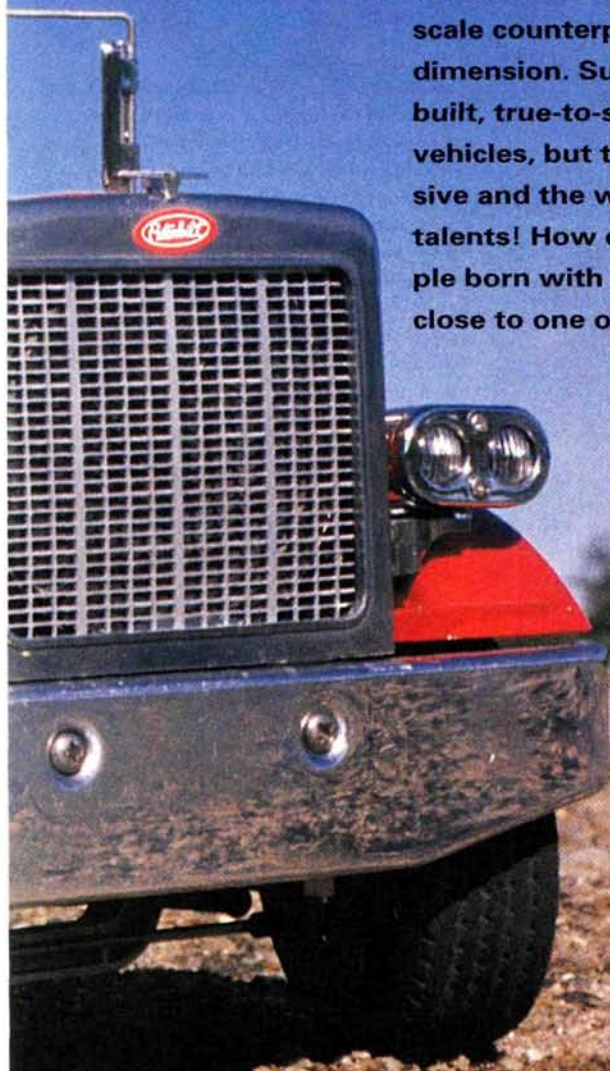
DRIVE TRAIN
Type Shaft drive
Final drive (type) Limited-slip differentials
Transmission 3 speeds forward
3 speeds reverse (manual shift)

SUSPENSION (F/R)
Type Floating axle, leaf springs
Damping None

WHEELS (F/R)
Type Machined aluminum
Dimensions (DxW) 1.38x0.63 in. (35x16mm)

TIRES (F/R)
Type Solid rubber

ELECTRICS
Battery 10-cell
ESC Wedico 192





Wedico, a German manufacturer that's relatively new to the U.S., has redefined the meaning of scale with kits that have easily eclipsed any previous commercial efforts and are available here through Precision Model Distributors*. Wedico's lineup includes a vast assortment of over-the-road-type trucks from around the world whose detail is sure to please even the most discriminating scale aficionados.

The Wedico trucks aren't really kits; you're given a "menu" from which to choose the components you want in your custom truck. You start by picking one of the many available truck bodies. The choice includes impeccably detailed cast-and-machined-aluminum bodies from Peterbilt, Freightliner, Mercedes, Volvo and MAN. There's also a conventional, "generic" body that resembles the Peterbilt.

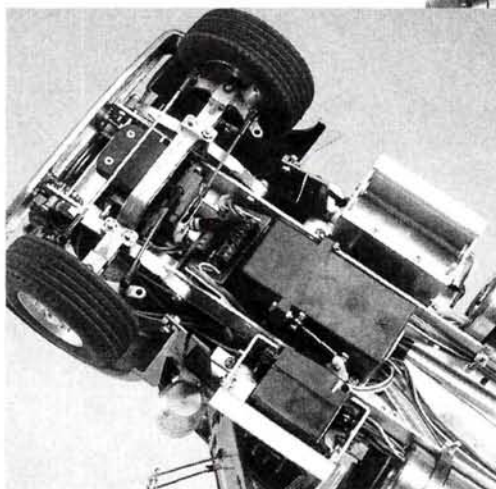
The Wedico truck underpinnings are impressive. The "budget minded" (relatively speaking, of course), might choose the simple standard chassis with extruded-aluminum-frame rails and relatively scale suspension components. Those who want more detail might shell out more for the "Pro" chassis that

includes a scale ladder frame and about 80 other bits and pieces that add up to a very scale appearance. The chassis are available in many lengths to suit trucks, tractors and tandems.

Finally, you choose a body or trailer type. There are just as many options here as with the cabs themselves, and each shows the high quality and same level of detail

as you'll find everywhere else in these trucks.

In addition to the obvious choices, there are a ton of accessories. The shortlist includes polished or diamond-plate fenders, many exhaust configurations, air horns, push-bars, fifth-wheel hitches, hydraulics, boat-transportation cradles, alloy wheels, fuel tanks, aluminum axle housings, light and sound packages, twin-motor drive systems and a refrigeration unit (about the only thing that doesn't actually function)—to name just a few!

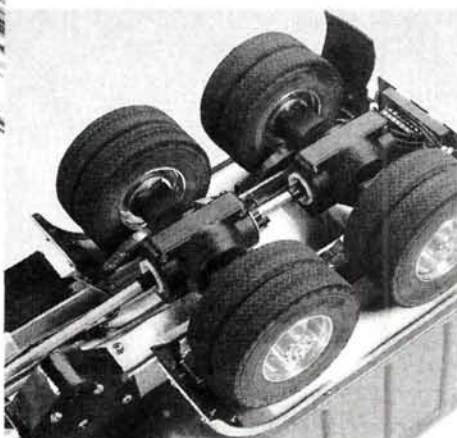


The electronic gear and battery pack are stowed in the cab. As you can see, the cab doors open, and the rearview mirrors are adjustable. Left: a cast front axle, aluminum-frame rails and metal hubs are strong and "scale." Note the gearbox servo. Below: each set of rear wheels has its own gearbox linked by a short hexagonal shaft. If you want to go all-out for realism, the plastic parts seen here can be replaced with more accurate metal pieces.



The truck featured here started with a conventional Peterbilt cab on a standard 24-inch chassis. The fully functional dump bed has a tail-gate that opens and a four-section, R/C hydraulic ram that tilts the bed for dumping (and leaks just like the real ones!)

Every body part is made of durable, cast aluminum that has been finished to a high red, black, or white gloss with a powder-coating process. Custom colors are available but take considerably longer to obtain.



The Peterbilt's finishing details include an electronic system that adds realistic lights and sounds. The electronics are connected to the controls and respond appropriately to the truck's movements.

The Wedico Peterbilt has the look of a real truck. A 6-channel Airtronics* system that has been converted to a ground frequency handles the truck's many func-

Team ORION MOTOR TECH

with Oscar Jansen

PART FOUR Motor Cans & Magnets

THE CAN

When inspecting the can, the first thing we notice is the holes. The openings improve airflow in the can, and this helps cool the internal parts of the motor. More on the cooling later.

Viewed from the front, we see the external pressing, where the bearing or bushing is fitted. The tolerances must be very close, or the bushing/bearing may rattle in the can (which robs power and reduces the life of the parts); or, if the fit is too tight and a bearing is used, the bearing may bind, and this could increase friction and cause premature failure.

To secure the can, two pairs of 3mm holes are provided. In some instances, the holes may be selected to offset the motor farther from or closer to the spur gear than the car's motor plate would typically allow.

Many different can designs are available, and the latest designs are all improvements in their own way. It's important to me that the design be made for improved cooling efficiency and speed, and not just for nice looks. After much testing, Team Orion has arrived at the best design. Minimal can material is removed (to maintain a strong magnetic field), and cooling is excellent; this increases the life of the magnets and the speed of your motor. Slots between the magnets increase airflow, so hot air coming from the commutator and the armature will dissipate quickly and won't increase magnet temperature. In addition, we do not follow the "color" fashion in our top-range motors; we use a black coating on the can, as black dissipates the heat better. A cool motor is a fast motor!

That takes care of the critical outside components; let's look inside.

MAGNETS

The magnets are glued to the can with high-temperature epoxy cement. To simplify assembly, the magnets are not magnetized. The charging is done after the epoxy has been hardened in an oven. "Stops" are stamped into the can to properly position the magnets. On the back of the magnets, you may notice some white paint; this typically indicates the positive magnet.

Magnets are being improved all the time, although not as frequently as some manufacturers would have you believe. Many varieties of magnets are available, but due to racing regulations, only a few are used by motor manufacturers. It is impossible for racers to see which type is in their motor, so they must trust the manufacturer's rating. Team Orion has decided not to enter the numbers game with magnets; to keep things simple, we call our new magnets G8: "G" for generation, and "8" for the year used—1998.

Magnets tend to weaken as they are used. This becomes more noticeable when your motor gets hotter and hotter and loses bottom-end and mid-range power and efficiency. By lowering the gear ratio (smaller pinion/bigger gear), we can extend the lives of our magnets dramatically. Good cooling is very important, as heat is a magnet's biggest enemy!

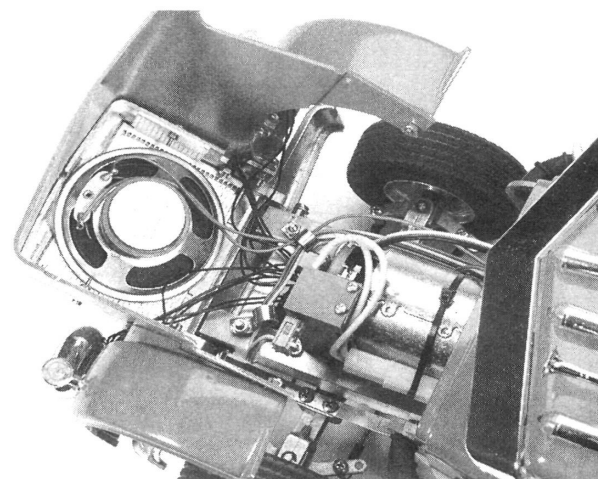
Next month, we will examine brushes and springs. Good luck racing!

WEDICO TRUCK

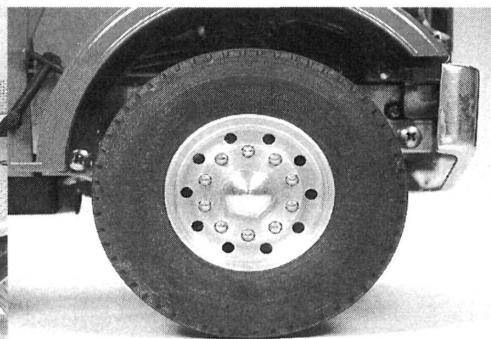
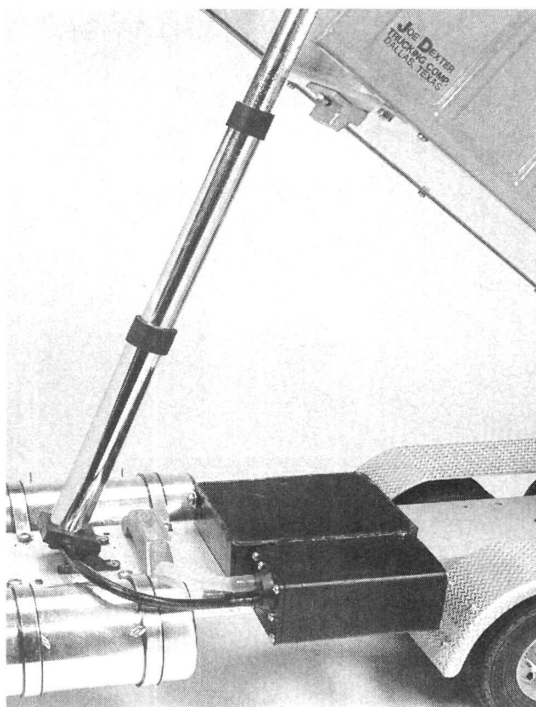
tions. When you flip the left stick to the left, the "engine" cranks up (or sounds as if it does!).

The right stick controls forward and reverse and left and right movement. As throttle is applied, the sound system, which monitors the voltage going to the motor, gives a faster-revving engine sound. A flip of the channel-five switch drops the big truck into second gear, and the sound system reacts accordingly. A few seconds in mid-gear, and it's time to hit overdrive. You might think that by now, the truck would be flying with that big German motor, but Wedico would never let that happen. In high gear, the big Peterbilt cruises along at a

stick upward, and it activates the four-stage hydraulic cylinder to lift the bed and dump the load. Your job is done! Flip the left joy-



Above: a speaker in the nose of the truck delivers realistic motor sounds that "rev up" as the truck accelerates. The Bohler 7-pole motor (standard R/C motors have 3 poles) is also visible. Left: the true-hydraulic dump-bed lift is fully operational via R/C. Below: scale wheels and tires are included. Note that the wheel's mounting nut is concealed.



pokey 8 to 10mph—just about perfect scale speed—but what it loses in sheer speed, it gains in brute pulling power (another trait of a conventional, Peterbilt dump truck). Little fazes the mighty mover: uphill or down, loaded or not, this thing just keeps chuggin' along.

The fun stuff doesn't start, however, until the truck comes to a stop. As you throttle down and find the dump zone, the sound system emits that familiar airbrake hiss. When you crank the wheel to one side to guide the truck in, the turn signals light up. Flip the left joystick to the right a couple of times to sound the air horn and warn everyone to stay clear while you back up (can you believe there's no reverse beeper? I'll tell ya ...). Bring the truck to a stop again, and it bleeds off the air pressure from the brake system in preparation for the dumping operation. Flip the left joy-

stick downward to drop the bed, and then motor away into the sunset.

This truck really takes you back to the sandbox, when, with that Tonka truck, you imagined that you were part of a grand construction project. With the Wedico trucks, however, you've graduated to the world of big-boy toys. Everything about them is "first cabin"—including their price tag. These trucks certainly aren't for the faint of heart or checkbook. The basic chassis and truck body will set you back about a G-note. Add all the fun stuff that you see here and have it all assembled for you, and you're in the 3,600 range (that's dollars, not pesos). If truckin' is your thing and you're a real stickler for the best, look no further: it doesn't get any better than this!

*Addresses are listed alphabetically in the Index of Manufacturers on page 273.

RACER

news

sponsored by

MIP

Race With US

by George M. Gonzalez

GET UP TO SPEED WITH ...

- 155** INNOVATOR AT WORK • Interview with Peak Performance's Rick Hohwart
- 156** SPEED SHOP • Ride Competition Parts Instant Adhesive and Surface Treatment Primer for rubber tires; MIP's new boost bottle and rear boost chamber for .12-size engines, and 1/10-scale side exhaust tuned pipes and headers for touring cars and racing trucks; Hitec's new HS-225MG and HS-525MG metal gear servos
- 158** RACER PROFILE • Team Associated/Reedy driver Jason Ruona
- 158** RACER TIP OF THE MONTH • Team Associated driver Travis Amezcua
- 160** RACER NEWS MINI "HOW TO" • Add adjustable rear toe-in to your TA03
- 162** MINI RACE COVERAGE • Kyosho Off-Road Fuel Challenge

If you're a serious racer, you're no doubt familiar with Peak Performance motors and company owner, Rick Hohwart. Peak Performance motors have won major championships, and Rick himself has a long racing history; he's one of the legends of R/C, and it just so happens that Rick is this month's "Innovator at Work." He reflects on the old days of R/C and shares some insights on the future.

Team Associated/Reedy driver Jason Ruona is well known throughout the racing community as a levelheaded guy who has a positive attitude about R/C racing. He also works for Pro-Line/Protoform/Jaco,

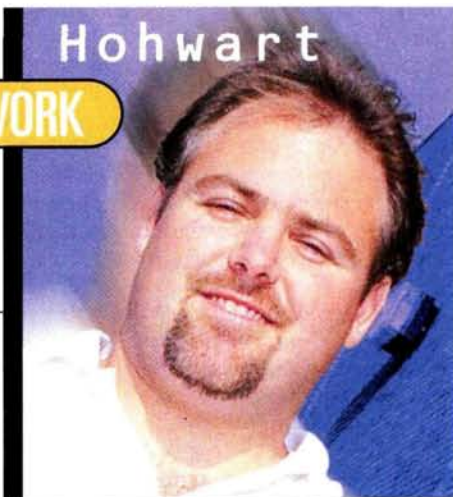
and assists with the research, design and development of new products. Jason is the subject of this month's "Racer Profile," so here's your chance to learn a little more about this talented young racer.

Our "Speed Shop" section features products from Ride Competition Parts, MIP and Hitec, and we've added a mini "How to" that shows how to make rear toe-in adjustment possible on all Tamiya TA03 series vehicles. Team Associated driver Travis Amezcua passes along the "Racer Tip of the Month," and we highlight the action from the "Kyosho Off-Road Fuel Challenge."

Rick Hohwart is the owner and founder of Peak Performance, a company that's well known for its racing motors, batteries and accessories. Rick has also been a national champion multiple times, and he has a long history of success. He's also a racer who has turned his hobby into a successful business. Although it sounds great to run your own hobby-related business, Rick admits that his busy work schedule often means he's short on time to enjoy the hobby himself—as you'll read in this month's "Innovator at Work."

INNOVATOR AT WORK

Rick Hohwart



Radio Control Car Action: Rick, how did you become involved in R/C racing?

Rick Hohwart: I bought my first "real" R/C car in 1982, when I was 14, but I played around with toy R/C cars throughout my childhood. I was fascinated with cars and racing in general, and I stumbled across a mail-order catalog from a company that sold plastic models. They had a section dedicated to R/C cars, with some photos that were taken at races. I knew right then that I had to get involved. So after a little research and some trips with my dad to a couple of local races, I bought an Associated RC12E and started racing.

RCCA: How long did it take you to become truly dialed?

RH: Things were a lot different back then, as far as tracks were concerned. Most were temporarily set up in parking lots, so the only time to practice was on race day, and even that time was limited because there were only 12 or so legal frequencies. I raced in the Southern California Series, which consisted of one race per week at a different track each time, and a championship was awarded in each racing class. I raced in the stock production class where the cars were basically box-stock with bushings, no differential and stock motors. I won the series by

finishing in fourth or better at every event then moved up to the stock and modified classes. I guess I was pretty dialed from the start.

RCCA: You've raced with all the R/C legends. What was it like in the early days, racing with guys such as Cliff Lett, Gil Losi Jr., Jay Halsey and Chris Moore? What was different about R/C racing, then and now?

RH: Because I came from an on-road background and didn't really start racing full time until 1989, I never really competed against the legends of off-road as much as I could have. Cliff Lett and I have had some good battles, and I have raced against Jay Halsey and Gil Losi Jr. When I started, the guys to beat were Joel Johnson, Mike Lavacot, Kent Claussen and Bruce Hickman. Off-road racing didn't even really exist at that time.

Back then, racing was a lot more family oriented. If you were young like I was, you would go racing with your father or other family member. Nowadays, parents drop their kids off at the track and then pick them up later.

RCCA: Which aspects of R/C racing are most enjoyable to you, and which aspects, if any, directly influenced your decision to become involved in the R/C business?

RH: The competition that R/C racing provides is by far the best. You also get to meet a lot of nice people and travel to some nice places. I think my involvement in the R/C business is something that evolved naturally; I can't give credit to any one particular aspect of R/C racing as being influential.

RCCA: When was Peak Performance officially launched? What were the company's first products?

RH: My partner at the time, Mike Hickman, and I started Peak Performance in 1985 selling accessories like tire-traction additive, but a year later we realized that even if we sold a ton of the stuff, we weren't going to make any money, so we decided to give the motor and battery business a go. At that time, there weren't many companies making motors, and both Mike and I had plenty of experience with motors. We also knew someone who could make us a battery tester—battery testers were all custom-made at that time—that would allow us to

Continued on next page

INNOVATOR AT WORK

Continued from previous page

match cells. We won the '86 ROAR 1/12-scale nationals, which was our first race using our own motors and batteries. It was really incredible!



RCCA: Peak Performance is back in the battery business. What can you tell us about the new battery line?

RH: Peak matched and sold batteries in the past with great success, but the point came when it was not cost-effective to do them ourselves, so we worked out a deal to import them from Europe. This worked well for a while, but with the increasing competition, we were no longer able to compete selling batteries in this manner. By selling our own batteries, we are able to put more money into developing new techniques that will bring better products to the marketplace and offer better prices to the consumer.

Peak's PowerFlo batteries are voltage-enhanced using custom-built equipment and then cycled and tested at 30 amps using state-of-the-art Competition Electronics equipment. The batteries are available in three grades based on voltage and run time, and they are sold worldwide.

RCCA: What do you like to do when you're not at the office?

RH: My life pretty much revolves around Peak Performance, but I like to spend time with my wife, Traci, and my dog, Emma. I enjoy going to the movies and following most types of motorsports, and I'm also a big hockey fan. I enjoy going to both Ducks' and Kings' games whenever possible.

RCCA: How do you find the time to practice and run a business at the same time?

RH: Well, that's always been the hard part about this whole thing. It is tough to deal with this stuff all day and then try to drag myself through an hour of traffic to go attend a club race. But I realize that the only way to have a chance of winning is to keep practicing. I've found myself going to the big races and spending the entire first day learning how to drive all over again. This year, I started racing the NORRCA series, which allowed me to compete at six different events. I feel that's the reason that I've done so much better this year. I realize now that I need to make the time to race if I'm to remain competitive.

RCCA: Thanks for your time, Rick. I'm sure I'll see you at a race soon!

Speed Shop

Prime it up before you glue it down

We've all heard the Winston Tire Co. slogan, "A lot is riding on your tires." These words are certainly true in R/C racing because tires are the single most important element of the tuning process. But if tires are so important, why do I always see guys at the track running their cars with tires that have come unglued from the wheels? Properly gluing your tires to the wheels is extremely important; it can make the difference between qualifying fourth in the A-main or being the pole sitter in the C-main.

Ride Competition Parts* has just made it easier and more effective to glue tires with its RQ-4 Instant Adhesive and RQ Primer Surface Treatment (sold separately). Out of the package, tires and wheels usually have mold-release compound on their mounting surfaces, and this can prevent the adhesive from curing effectively. Ride's RQ Primer contains ethyl alcohol and is designed to remove those substances simply by squeezing its pump nozzle. All you have to do is spray the mounting surfaces of the wheels and tires with the RQ Primer then wipe the surfaces clean with a rag. The wheels and tires will then be ready for bonding, and they'll stay bonded because the adhesive will be able to cure properly.

While we're on the subject of glue, check out Ride's new RQ-4 Instant Adhesive; it comes in a tube instead of a bottle, is fast curing and really sticks to rubber surfaces. RQ-4 Instant Adhesive comes with a fine-point applicator for precise application and a locking cap to keep the glue fresh when not in use. And the 5g tube doesn't take up much room at all in your toolbox. Check out these great new products from Ride and quit driving around with flat tires! **Part nos. and prices—RQ-PR (RQ Primer Surface Treatment), \$16.99; RQ-4 (RQ-4 Instant Adhesive), \$5.99.**



Heavy Metal from Hitec

Hitec* has added two new metal-gear servos that are likely to become popular with on- and off-road racers at all levels. The new HS-525MG shares the HS-525BB's fast transit time and strength (.12 seconds and 55 ounces of torque @ 6.0 volts) and bearing-supported top gear, but adds the ruggedness of metal gears. The 525MG is perfect for nitro or electric off-road racing and works well in touring cars, too. The new HS-225MG Mighty Mini servo matches the specs of the popular HS-225BB (.11 seconds and a torque rating of 77 ounces @ 6.0 volts), but adds metal gears. This servo is perfect for 1/12- and 1/10-scale on-road racing and is just right for touring cars that have minimal mounting space.

Part nos. and prices—32525 (HS-525MG), \$69.95; 32225 (HS-225MG), \$58.95.



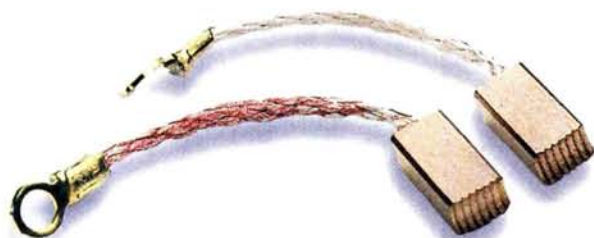


Brushin' up

Trinity has released polarized brushes for maximum power and longer commutator life for any motor that uses standard-size brushes. Using different-compound brushes (silver/copper) for the positive and negative sides of the motor increases performance without increasing commutator wear. These brushes feature serrated faces that break in quickly. Serious stock and modified racers will no longer need to purchase two pairs of brushes to fine-tune their motors.

Brush shunts are color coded to indicate on which side of the motor they should be installed.

Part nos. and price—RC4390 (stand-up-style brush); RC4391 (lay-down-style brush); \$3.50.



Tune Up Then Boost Up

MIP's* Stinger tuned pipes' rear-exit design have made them very popular over the years—for good reason; they increase the performance and reliability of all .12-size engines while providing a satisfying scale appearance. The growing popularity of nitro-powered touring cars and racing trucks, however, means racers have been looking for a more conventional side pipe carrying the MIP logo. MIP has answered the call by releasing its new, 1/10-scale Side Pipe Kit. It includes the tuned-pipe side-exit header and all the hardware. Three kits are available: the touring-car kit that fits most touring cars with either pull-start or non-pull-start engines; the off-road kit with pull-start that's designed to fit those Associated RC10GTs, Team Losi GTXs and Traxxas Nitro Rustlers equipped with pull-start engines; and the off-road without pull-start kit, for, well, you know.

MIP has also released its new Boost Bottle and Rear Boost Chamber that are designed to fit the O.S. CV, CZ and all Dynamite and Thunder Tiger .12-size engines. According to MIP, the Boost Bottle and Rear Boost Chamber will increase your engine's bottom-end acceleration while making the power band more consistent. The Boost Bottle is a self-contained unit that captures the look of an NOS (nitrous oxide)

canister and can be mounted anywhere space permits around the engine; this makes the unit perfect for both pull-start and non-pull-start engines. The Rear Boost Chamber is actually bolted onto the back of the engine over the backplate and will work only with non-pull-start engines.

Some modification is required to install the Boost Bottle or Rear Boost Chamber, and the kit includes everything you'll need to complete the job. Call your hobby shop or MIP for more information.

■ 1/10-scale Side Pipe Kit

Part nos. and prices—3042 (touring car), 3043 (off-road with pull-start), and 3044 (off-road without pull-start), \$47.50; 3057 (Boost Bottle), \$29.95; 3058 (Rear Boost Chamber), \$33.



RACERnews

RACER PROFILE JASON RUONA



Team Associated/Reedy driver Jason Ruona is well known as a competitive R/C racer, and he recently began a career with Pro-Line as an engineering assistant; he is actively involved with the design and development of new tires and other racing products. I had a chance to talk with Jason at the Pro-Line/Reedy/R/C Car Action Endless Summer Classic; here's what he had to say.

VITAL SIGNS

Age: 21

Sponsors: Associated, Reedy, Pro-Line, LRP, Yokomo and MIP

Years racing: 7

Occupation: Research and development for Pro-Line USA

Hometown: Redlands, CA

First R/C car: Tamiya Clod Buster

Favorite racing class: Modified truck

Favorite track: Lake Park in Tampa, FL

Favorite race: Florida Winterchamps

Major victories: 2nd place at two different nationals, placed 2nd three times at the Florida Winterchamps, and A-main finalist at the '96 Off-Road Worlds

Radio Control Car Action: Jason, you've been racing at a professional level for many years, but lately, you haven't been competing as much. Why is that?

Jason Ruona: It was difficult for me to attend all of the major races throughout the '97 and '98 seasons because I was trying to finish school and work full time at Pro-Line at the same time. During that period, it was hard to find time to practice and race. I plan on competing at most of the major events in '99, though.

RCCA: You must still practice quite a bit, since you're always fast whenever you do race. How often do you practice, and where do you usually go to race?

JR: Actually, I've spent very little time practicing or club racing because most of my attention was focused on my job at Pro-Line. I just didn't feel that practicing was making the best use of my time. But I'm glad to know you think I'm still fast.

RCCA: What are some of the things you enjoy most about racing?

JR: I enjoy spending time with my friends, most of whom I met through racing. R/C racing allows you to meet a lot of nice people; that's the best part about it.

RCCA: How would you characterize the current professional racing scene?

JR: Racing has definitely changed from when I first began competing. When I started racing, it seemed as if the drivers were excited about their cars and equipment. They were focused on winning, and the satisfaction they received from winning. Nowadays, most racers seem to focus on the monetary benefits of racing, which I feel is least important. Racing itself is what's important.

RCCA: Which drivers do you most enjoy competing against?

JR: Well, I enjoy competing against any driver who has a good attitude about racing.

RCCA: What are some of your responsibilities at Pro-Line/Protoform/Jaco?

JR: My primary responsibilities at Pro-Line include working with engineer Tim Clark on the research, design and development of new products. I assist in the development of tires, wheels and bodies, as well as provide Dale Epp with input on all of Protoform's latest body and decal projects. I also travel to most of the major racing events to support our racing team.

RCCA: What's it like working with the "Squirrel" — Scott Hughes. Is he still a madman?

JR: Scott is pretty much out of control most of the time. He's always funny and keeps everyone laughing. On the other hand, he also knows his job responsibilities, and he's good at getting the job done.

RCCA: I know that you're probably busy most of the time working at Pro-Line, but do you, Scott, Tim, Todd and Joe ever find time to race R/C cars during the day?

JR: Unfortunately, we haven't; but we have talked about putting a track behind our building, just for that.

RCCA: What else do you like to do when you're not working or racing?

JR: I like basketball a lot, so I play as often as I can.

RCCA: It was a pleasure talking to you, Jason. I wish you the best, my friend.

NEWS FLASH



Mark Pavidis Ties the Knot

On September 26, 1998, Team Associated factory driver and secret MIB (men in blue) agent Mark Pavidis got hitched, which meant he had to turn in his little black book once and for all.

Mark did get to keep the blue suit, though. Mark and his lovely wife, Susan, are shown here posing for their first photo as husband and wife. The R/C Car Action staff would like to congratulate Mark and Susan and welcome them to the wonderful world of matrimony.

RACER TIP OF THE MONTH

Travis Amezcua
Team Associated driver

Remember to make small holes in your off-road tires so the air inside can vent. If you don't, your vehicle will bounce around like a Super Ball once the tires have been glued to the wheels with CA. One small hole is all that's necessary, and you can make it with a drill bit, hobby knife, scissors, your teeth (just kidding), or any other sharp tool. You can accomplish the same thing by drilling small vent holes in the wheels, but I prefer the aforementioned method. Either way works fine; the choice is yours.

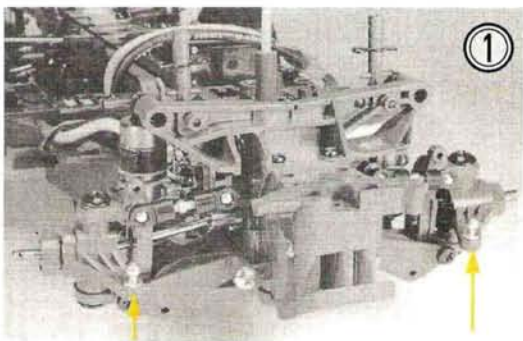


RACER news

HOW TO Add rear toe-in adjustment to your Tamiya TA03

Last month, we showed you how to beef up your Yokomo YR4-M2's front suspension by installing torque rods. This month, in keeping with the same "neat things you can do with tie rods" theme, we're going to show you how to add rear toe adjustment to any TA03 series vehicle by installing rear toe adjustment rods. The TA03 chassis comes stock with approximately 2 degrees of rear toe-in and 2 degrees of anti-squat on each side of the vehicle, and this is just about right for most track conditions. There are times, however, when being able to add a little more rear toe-in and anti-squat can come in handy, such as when racing on slippery parking-lot surfaces.

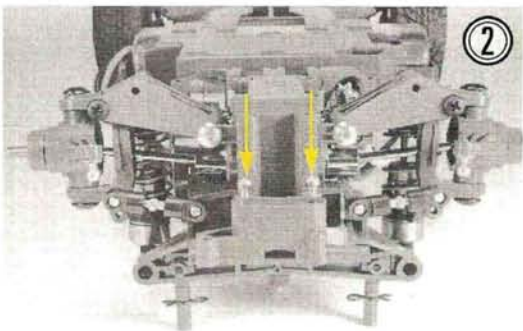
Because the TA03's front and rear suspension arms are interchangeable, you can install the front caster blocks (hub carriers) and steering knuckles (knuckle arms) on the rear suspension arms and use an additional set of tie rods to adjust the toe angle of the steering knuckles. The caster blocks have built-in caster and will add about 5 degrees of anti-squat for an approximate total of 8 degrees. If you choose to install Tamiya's optional front hub carriers, your car will end up with a total of 4 degrees of anti-squat instead of 8. Here's how:



①

STEP 1

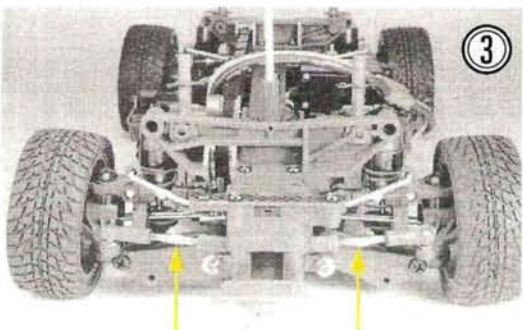
Remove the rear tires and wheels, axle carriers and dogbones from the vehicle. Next, install the caster blocks and steering knuckles where the rear axle carriers were, as shown in the photo. You'll need the four kingpin screws to secure the steering knuckles to the caster blocks. While you're at it, install a ball connector to each steering knuckle, as shown.



②

STEP 2

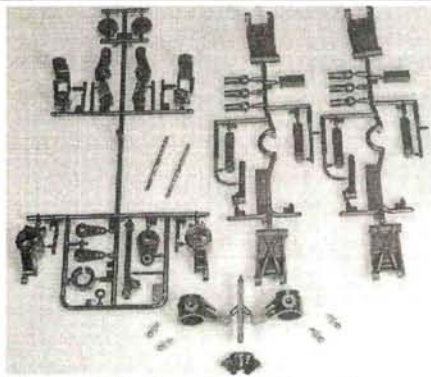
Remove the rear bumper and thread two ball connectors into the two holes just behind the bumper-mounting bosses.



③

STEP 3

Thread the Tamiya ball cups onto the 1/8-inch tie rods. Make two identical 2 3/16-inch rods. Next, install the tie rods from the steering knuckles to the rear bulkhead as shown, and you're finished. Your car should now have very close to 2 degrees of rear toe-in on each side of the vehicle, which is the factory setting. Adjust it to your liking.



The modification does not require any grinding or drilling and can be completed in less than 10 minutes. Here's what you'll need to complete the modification.

- Tamiya knuckle arms—part no. 50705.
- Tamiya C parts tree (includes the two caster blocks)—50700, or Tamiya optional aluminum front hub carriers—53316.
- Tamiya step screws (package of four)—MA22.
- Tamiya ball connectors (package of 10; only four will be used)—50592.
- Two Tamiya D parts trees (includes six ball connectors, but only four are necessary)—50701.
- 1/8-inch tie rods (preferably titanium)

Adjusting Rear Toe and Bump Steer

You may notice that your car has a little rear bump-steer now (the wheel angles or toes out as the suspension is compressed). You can remove the bump-steer by shimming up the inner ball connector with washers, but I've noticed that having a little rear bump-steer isn't necessarily a bad thing. For example: when a car takes a sharp right turn, the rear suspension compresses on the outside, while the inside rear suspension extends. Having a little bump-steer allows the outside wheel to straighten out (less toe angle), while the inside wheel turns in slightly, and this can actually help the car steer into the corner, kinda like 4WD steering. Try it out before you start shimming.

As mentioned earlier, the standard 2-degree toe angle will probably work on most track conditions, but when the track gets slippery, try adding a little more rear toe-in. If you're just into making ballistic runs down your street, and you don't plan to race, try taking away rear toe-in for more speed. Experiment! A little rear toe adjustment might just get you dialed.



RACER **n**ews

Kyosho Off-Road Fuel Challenge

by Greg Vogel

When an event has "nitro fuel challenge" in its title, you know it's a big race with fast nitro cars. Add a manufacturer such as Kyosho, and you have some heavy hitters. At the Kyosho Off-Road Fuel Challenge at J.R.'s Race Place in Waldorf, MD, big names such as Richard Saxton, Kris Moore, Doug von Mosch and Dave Henry made an appearance to vie for the top spot. There were four classes: 1/8-scale Buggy and Truck and 1/10-scale Buggy and Truck. Here's the scoop.

1/8 BUGGY

Drivers had 45 minutes to battle it out. The start was pretty clean, Doug von Mosch soon found himself in the lead with an anxious pack at his back door.

Dave Henry was on the move and drove past von Mosch's Mugen to take the lead; he never gave it back. At 18 minutes, it was all over for crowd favorite Richard Saxton, but it was far from over for the race itself, as the hot action continued.

At the midway point, in hot pursuit of Henry, Laro driver Greg Degani had a switch wire fray loose and send his buggy skyward at the end of the straight. His demise left only five possible contenders. Tom Baffer (of Bruckner Hobbies) and von Mosch encountered a few technical difficulties and dropped off the pace, leaving Dave Henry, Kris Moore and Tim Long up front—all piloting Kyosho MP-5s. But Henry's clean, smooth driving allowed him to stretch his lead, and at the buzzer, he took the win; Kris Moore, four laps down, was in second and Tim Long, six laps from the leader, was third.



1/8 TRUCK

If you want exciting racing, 1/8 truck is the class to watch. You have to hand it to their drivers: keeping all four wheels of these powerful stadium-style racers on the ground is a major challenge; and at this event, they had to do it in a rain storm!

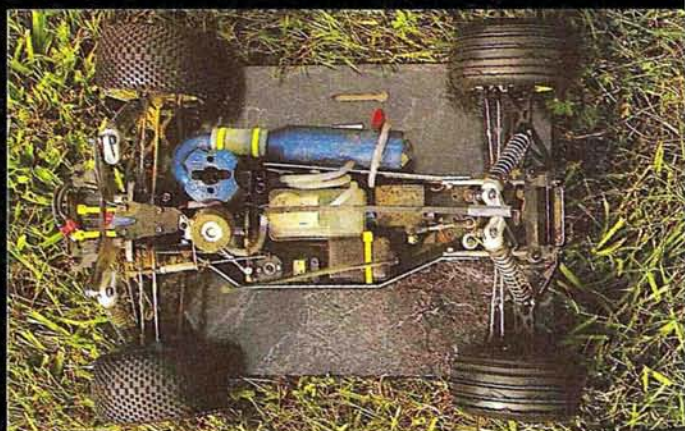
As the rain brought up the oil, the track resembled a skating rink, and it was hard for racers to find traction. At the start, radio problems

w i n n e r s

Dave Henry's MP-5



Richard Saxton's RC10GT



RACERnews



1/8 Nitro Buggy A-main.



1/8 Nitro Truck A-main.



1/10 Nitro Truck A-main.



1/10 Nitro Buggy A-main.

claimed Tim Long, and Dave Henry soon took the lead, but after 13 minutes, technical problems sidelined him, too.

That left six to chase down the lead. Peter Head claimed the top slot and never looked back. At the end, he had a three-lap lead over Greg Waller, who was followed by Edward Wong.

1/10 BUGGY

Although it wasn't the biggest class, this was still a great show to watch. Robert Caruso, Chris Osmond, Gary Sinclair and Carlton Coleman started in that order for the 20-minute Main. Extra credit goes to these guys, as the .12-powered buggies required extra finesse to get them around the big track. Take a jump too hard, and the force of the impact could spell disaster for your machine. Gary Sinclair withdrew with technical problems at the 3-minute mark, but Robert Caruso drove expertly and won with 42 laps. Chris Osmond came in three laps behind him, and after dropping out at the 8-minute mark, Coleman was third.

1/10 TRUCK

This was truly exciting; all but three of the trucks were able to endure the 45-minute Main. Greg Degani was on the pole when the starter waved his hand and the pack took off, but Team Associated's Richard

Saxton, driving an RC10GT, soon found his way into the top slot. The determination evident on his face showed that he meant to win, but determination isn't always enough; fantastic driving was a definite requirement. Was he up to the challenge? You bet!

Todd Lewis, driving a Losi GTX, fell into second and held his place to the end. Third was up for grabs, though, till close to the end. TQ Greg Degani held it for most of the race, but an anxious Doug von Mosch and Chad Bradley were close on his battery tray. With just over 2 minutes to go, Degani had steering problems that allowed von Mosch and Bradley to jet past and claim third and fourth, respectively. Degani managed to hold it together enough to finish in fifth.

RACE WRAPUP

The Kyosho Off-Road Fuel Challenge was a complete success; J.R.'s Race Place is a topnotch facility and provided an enjoyable weekend of exciting racing. Pit tables and a tent were set up for drivers, and the track was always well groomed—the perfect venue for such an event. When the next Kyosho Off-Road Fuel Challenge appears on the calendar, be sure to take time off, register and race. Those are my plans, anyway.

*Addresses are listed alphabetically in the Index of Manufacturers on page 273. ■

KYOSHO OFF-ROAD FUEL CHALLENGE

1/8 Buggy A-main

FIN.	QUAL.	DRIVER	CHASSIS	ENGINE	PIPE	FUEL	RADIO	TIRES(F/R)
1	5	Dave Henry	Kyosho MP-5	O.S. RZ-B	Kyosho	O'Donnell	Futaba 3PJ	Kyosho
2	4	Kris Moore	Kyosho MP-5	Paris Picco	Paris AL 650	O'Donnell	KO Propo Mars	Kyosho
3	10	Tim Long	Kyosho MP-5	Rex SBK	Paris AL 650	Blue Thunder	Sanwa	Kyosho
4	2	Doug von Mosch	Mugen MBX-4	Rex short stroke	Mugen 067	O'Donnell	—	Pro-Line
5	9	Tom Baffler Jr.	Kyosho MP-5	O.S. Max 21 RZB	Kyosho	O'Donnell	Futaba 3PJ	Pro-Line
6	1	Greg Degani	Laro D2 Diablo	NovaRossi Top 3-port	Top EFRA 053	O'Donnell	Futaba 3PJ	Pro-Line
7	6	Brian LaVigne	Kyosho MP-5	O.S. RZ-B	Rex	O'Donnell	KO Precious	Kyosho
8	7	Peter Head	Kyosho MP-5	O.S. RZ-B	Paris	FSR	KO	Kyosho
9	3	Richard Saxton	Mugen MBX-4	Paris Picco	Rex	Blue Thunder	JR	Pro-Line
10	8	Chad Bradley	Kyosho MP-5	Paris Picco	Paris	O'Donnell	Hitec	Pro-Line

1/8 Truck A-main

1	2	Peter Head	FTD Kyosho	Paris Picco	Paris	FSR	KO	Big Wave Dave
2	1	Greg Waller	Kyosho MP-5	NovaRossi Top 3-port	NovaRossi 086	O'Donnell	Airtronics M8	Kyosho
3	5	Edward Wong	Kyosho MP-5	O.S. RZ-B	Kyosho	FSR	KO Precious	Big Wave Dave
4	7	Ron Brott	Kyosho MP-5	NovaRossi 6T	NovaRossi 065	Byron	JR	Kyosho
5	6	Brad Dewey	Kyosho MP-5	O.S. RZ-B	Paris AL 650	O'Donnell	Futaba 3PJ	Kyosho
6	8	Chris Perry	Kyosho MP-5	O.S. RG-B	DuraTrax	Byron	Airtronics 3PS	Kyosho
7	3	Dave Henry	FTD Truck	O.S.	Paris AL 650	O'Donnell	Futaba 3PJ	Big Wave Dave

1/10 Truck A-main

1	2	Richard Saxton	Associated RC10GT	O.S. CZZ	Associated	Blue Thunder	JR	Pro-Line
2	4	Todd Lewis	Losi GTX 2000	O.S. C.V.	O'Donnell	O'Donnell	Airtronics M8	Losi Silver Directionals/Losi Silver T-2000
3	3	Doug von Mosch	Associated RC10GT	O.S. Max by Chester P	Associated	O'Donnell	—	Pro-Line M3 Edge/Pro-Line Hoeshots
4	6	Chad Bradley	Associated RC10GT	R.B.W. Racing	Associated	O'Donnell	Hitec	Pro-Line Hoeshot/Pro-Line Edge
5	1	Greg Degani	Associated RC10GT	R.B.W. Racing	Associated	O'Donnell	Futaba 3PJ	Pro-Line M2 Edge/Pro-Line M3 Bowtie
6	9	Aaron Joyce	Losi GTX 2000	O.S. CZZ	Associated	O'Donnell	KO Propo Mars	Pro-Line Edge/Pro-Line Hoeshots
7	5	Kevin Ganoe	Associated RC10GT	O.S. C.V.	Associated	Blue Thunder	Airtronics 3PS	Pro-Line
8	7	Alvin Guy III	Associated RC10GT3	O.S. C.V.	Associated	Blue Thunder	KO Propo Mars	Pro-Line Edge/Pro-Line Bowtie
9	10	Kevin Yates	Associated RC10GT	O.S. C.V.	Associated	O'Donnell	Airtronics M8	Pro-Line Edge/Pro-Line Hoeshots
10	8	Bob Moore	Losi GTX 2000	O.S. C.V.	O'Donnell	Blue Thunder	KO	Losi Silver T-2000/Losi Silver Directionals

1/10 Buggy A-main

1	1	Rob Caruso	OFNA Pirate 10	O.S. Max C.V.	Stock	Byron	Futaba 3PJ	Losi Sprint Silver
2	2	Chris Osmond	OFNA Pirate 10	O.S. CV12	MIP	Blue Thunder	Futaba 3PJ	Pro-Line Fuzzies
3	4	Carlton Coleman	NA	NA	NA	NA	NA	NA
4	3	Gary Sinclair	Kyosho	O.S. CV	Kyosho	Byron	Futaba	Pro-Line Hoeshots

Haulin' grass

Models of wild racecars and fantasy vehicles are great, but what can you compare them to in the everyday world? After all, you don't often sidle up to a top-fuel dragster or a six-wheel monster truck at a red light. Sometimes, it's the models of the mundane that most impress us, since they are so immediately recognizable and familiar. Take Greg Mutz's landscaping rig and trailer, for example; they impress us not because of the subject, but because of the authenticity with which the model represents the subject. Since we are so familiar with the real thing, any detail Greg didn't get right would stick out like the proverbial sore thumb (or sore green thumb, perhaps?). We think you'll agree, this model is spot on, and that's why it's our Readers' Ride of the Year.



Is it "real" or RC? Greg Mutz's fine craftsmanship makes it hard to tell (the body pin is a giveaway). The sub came from a Tamiya Blackfoot, and Futaba electronics are used.



Readers' Ride of the Year



The Robart air cylinder that lifts the dump bed is an inspired touch. Note the frame rails of the Tamiya Mountaineer chassis, as well as its appropriate-size shocks and leaf springs. The axles and drive shafts were modified to accept "dually" wheels from Tamiya's King Hauler tractor-trailer kit.



The dump bed and utility trailer feature real oak flooring. The frames are MIG welded from steel stock for strength. They're

heavy, too; the truck alone weighs over 10 pounds! Greg handcrafted the dump bed's wooden ladders from steel, and installed the wheels with leaf spring suspension. The ladders were also welded to the "U" steel frame for extra strength.

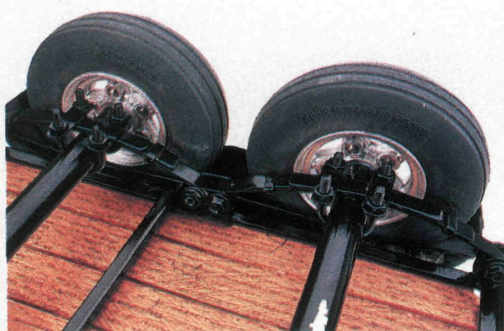


Greg also used MIG welded steel to construct the functional plow, which pivots left and right and is spring-loaded in case it snags a curb while plowing a driveway. The plow blade is also steel.

Year



The plow is completely functional. Hey Greg, can you swing by? My touring car is snowed in.



Scale leaf springs give the utility trailer a smooth ride. The wheels and tires are Tamiya Sand Scorcher parts.

THE WINNERS

1ST PLACE

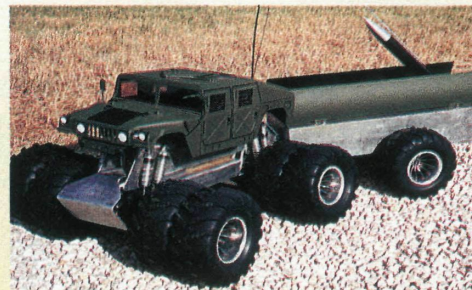
Greg Mutz, Brown Deer, WI

Greg's handiwork earns him the \$500 grand prize as well as a *Radio Control Car Action* T-shirt, decals and a one-year subscription (or extension) to the mag.

2ND PLACE

Kenneth Lyssy, Stockdale, TX

It's a monster Hummer that shoots rockets. How could we resist? Kenneth receives a *Radio Control Car Action* T-shirt and decals, plus "R/C Car Painting and Finishing Techniques," "402 R/C Tech Tips" and "R/C Car How-To's, Volume 2." Kenneth also receives a one-year subscription.



3RD PLACE

Kevin Michlig, Colby, WI

The appearance of his finely finished, custom nitro-powered sprinter on these pages means Kevin can expect to find a *Radio Control Car Action* T-shirt, a one-year subscription and decals in his mailbox soon.



Congratulations to all the winners!

The Power & The Glory

AMG Mercedes CLK-GTR



1:5 Scale

All New for 1999:
The FG Eco-Line.
High performance
R/C cars at
affordable prices.



New for '99



Formula 1, the "Kings Class" of Car Racing

AIPEX
The
ultimate
Power Source



NEW!!
Speed Controls
Available in 3 models -
Cubic, Square, Plus.

HATORI
Tuned Excellence



Headers and
Mufflers

FG Authorized Dealer: Advance Hobbies (Toronto, Canada)
(416) 321-8377 www.advancehobbies.ca

For more information on our complete line of R/C cars, model airplanes and accessories contact
MAGMA INTERNATIONAL LTD. at (905) 305-9753 or fax us at (905) 305-9755.

Visit us on the web @ www.magmarc.com **DEALERS WANTED.**

the original
POWERPOLE® CONNECTORS
the ultimate connection™

**RACE FASTER,
LONGER**



- ✓OUTPERFORMS all connectors--even hardwiring!
- ✓NEW & IMPROVED MATERIAL but still compatible with all Litespeed® or Sermos™ connectors
- ✓PATENTED technology
- ✓Lightweight & compact
- ✓Made in the U.S.A.
- ✓FREE STICKER with every order
- ✓FREE SHIPPING in the U.S., Canada or Mexico
- ✓FREE ACER Racing™ T-shirt (50pr order minimum)

The latest & best ever in R/C connector technology will dramatically increase speed & run times, decrease heat & extend motor & ESC life. Patented silver plated contacts outperform even gold. 2 pr: \$3. 10 pr: \$10. 50 pr: \$48. 100 pr: \$90.
T-shirt (please mention size: S,M,L,XL): \$15 (FREE with 50 pair minimum order).
3/32" TUNGSTEN CARBIDE DIFF BALLS only \$6.50 for 12 balls. The best, hardest & smoothest. Upgrade your DIFF today **WOW!** & experience the results.

ALL prices include FREE & FAST shipping to anywhere in the U.S., Canada or Mexico. All other countries please add 10% for airmail. Please send your name, address & check or money order (no cash please) payable to:

ACER Racing™

P.O. Box 5680 Santa Monica CA 90409-5680
www.acerracing.com info@acerracing.com
DEALER INQUIRIES INVITED

FIRST LOOK!

Yokomo

YR4-M2 Pro

by George M. Gonzalez

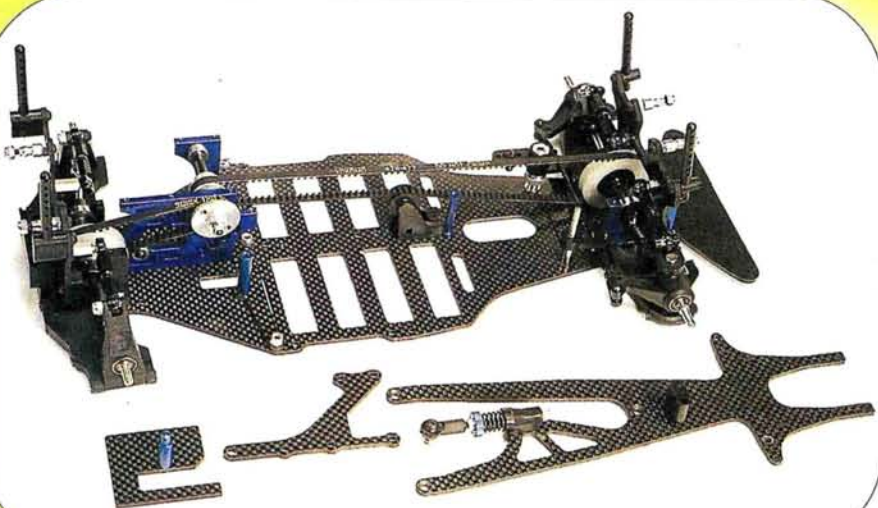
A factory ride you can own

It's no secret that Yokomo* has been testing and refining a pro-level version of the YR4-M2 Type J—a car that until now was only available in Japan. At the most recent IFMAR Worlds in England, Yokomo team drivers competed with prototype versions of the car you see on these pages, and factory pilots Masami Hirosaka and Barry Baker both finished with perfect scores (seven wins each). More recently, Brent Wallace piloted a production version of the new YR4-M2 Pro to first place in the Invitational class at the First Annual Reedy Touring Car Race of Champions and launched the car with a bang.

Yokomo's goal was to release a car that doesn't require hop-ups to win races. The YR4-M2 Pro comes equipped with all the goodies and is squarely aimed at top-level racers. In fact, the Pro is essentially the same car as factory drivers compete with, and that means that you can now be part of the Yokomo factory team—well, almost, anyway.



PHOTOS BY WALTER SIDAS



V IS FOR VICTORY

The V-shaped upper deck plate is bolted directly onto the front bulkhead and supports the steering bellcranks from above. The rear of the upper deck plate is supported by two aluminum posts that are secured to the lower chassis crossbeam. An inline-mounted coil-spring shock (one end mounted on the rear of the upper deck plate and the other end mounted on the motor mount) allows the chassis to flex slightly toward the rear of the chassis. Chassis flex can be adjusted precisely by increasing or decreasing the preload on the coil-spring "shock," to subtly affect rear



Brent Wallace recently won the inaugural Reedy Touring Car Race of Champions with his YR4-M2 Pro, shown here. Look for a detailed inspection of his car and setup info in the next issue's edition of "Racer News"!



STACKED DECKS

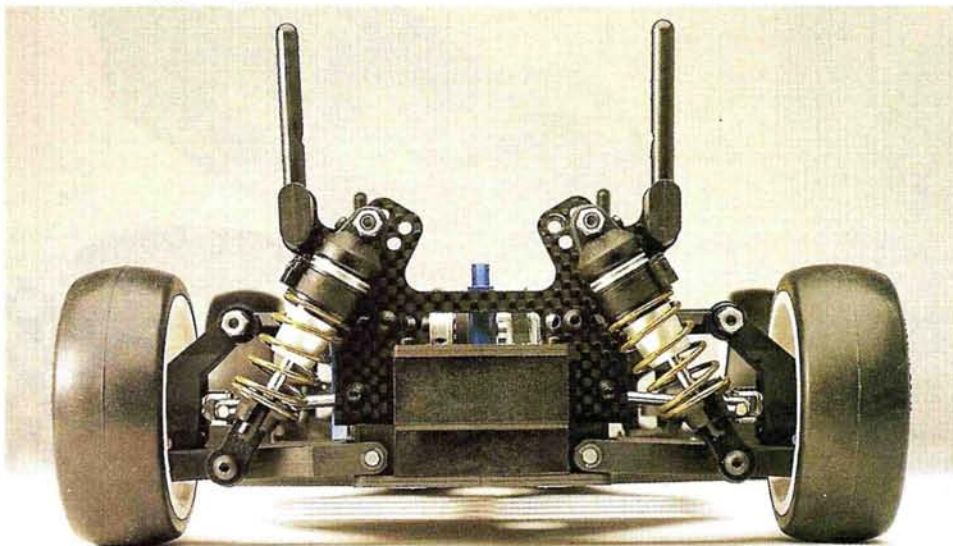
The Pro's most notable new feature is the triple-deck carbon-fiber chassis. Four battery slots on both sides of the chassis plate allow the cells to be mounted in a number of ways, including the 4x2 configuration (four cells on the right and two cells on the left), which is used by most of the Yokomo team drivers. A carbon-fiber crossbeam, which is bolted flat on the lower chassis plate in front of the motor mount, prohibits all but the slightest side-to-side chassis flex. Check out the piano-wire transponder mount; it actually offsets the weight of the motor (well, some of it, anyway).



traction. A short, carbon-fiber, rear upper deck supports the motor mount and layshaft; it is secured to the rear bulkhead with an aluminum post. By removing five screws and loosening a couple of grub screws, the layshaft and drive pulleys can be easily accessed. The Pro's drive train spins on 24 high-quality ball bearings to ensure the most efficient power delivery. You'll notice that the center layshaft, spur gear and front drive belt have been lifted off the chassis to allow use of larger, more efficient gears and to simplify battery mounting. Also included is a chassis-mounted belt/tensioner guide.

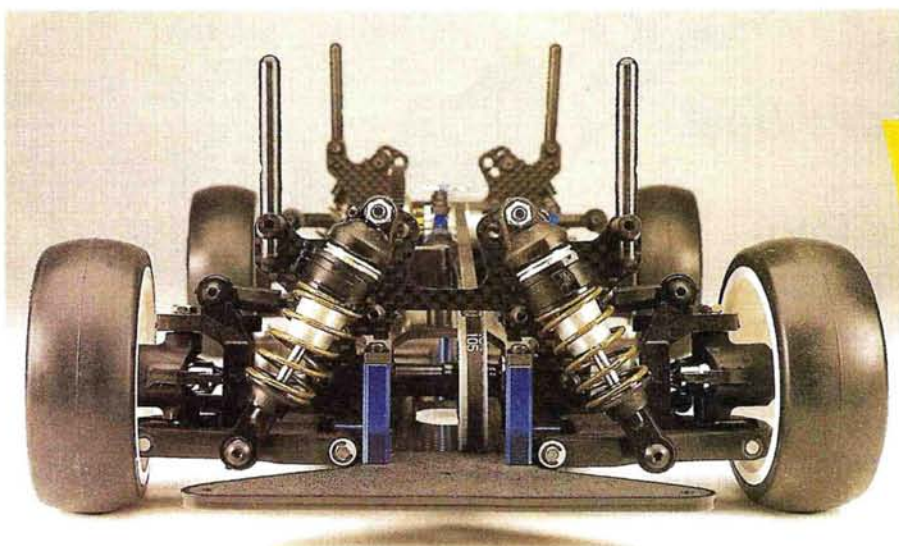
(Continued on page 220)

(Continued from page 217)



BRINGING UP THE REAR

The Pro's rear end may look like a carbon copy of the M2 USA's rear end, but the Pro includes hardened universal drive shafts and hinge pins, an improved ball diff and real racing tires. The aluminum-body shocks come with factory-installed O-ring seals and include Teflon-coated shock pistons. The shocks also include Yokomo firm Green Springs all around.



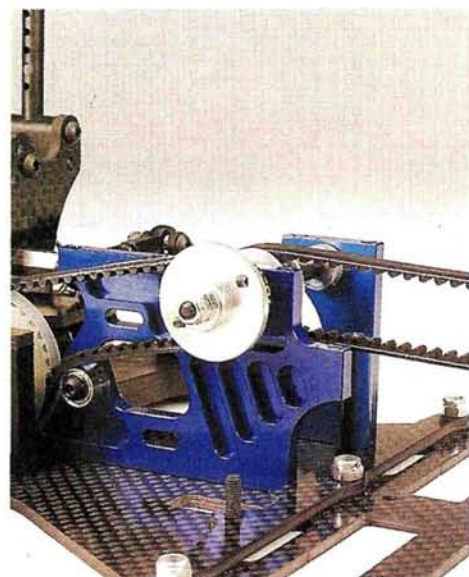
FRONT AND CENTER

The M2 Pro includes a two-piece, blue-anodized, machined-aluminum bulkhead that stiffens up the front suspension dramatically. The ball diffs now have twice as many balls. Hardened universal drive shafts and hinge pins are standard issue on the Pro, as are the firm compound Yokomo Sprint slick tires with firm foam inserts and 8-Spoke Mesh Wheels. Yes, the competition front bumper is also included, and that's a welcome addition. These are expensive upgrades on many other vehicles, but they are all on the Pro's extensive list of included hop-ups.

As you can see, the new M2 Pro is a serious touring car with all the bells and whistles an expert driver could ask for. But be warned: the M2 Pro will not come cheap, and it just might be one of the most expensive touring cars available. However, the old adage, "You get what you pay for," most certainly applies here. The Yokomo YR4-M2 Pro is a true factory

ride that we "regular guys" can own and race at Saturday-night club races.

Speaking of club races, I had a chance to carve a few laps at my local track with the new M2 Pro. I'll save my comments for the actual "Thrash Test," which is already in the works, but I can say this: the first few runs were absolutely ballistic, and the M2 Pro is faster and can carry



MISTER BLUE

The Pro comes equipped with an all-new blue-anodized-aluminum motor mount that has been machined to reduce its weight as much as possible without sacrificing strength. A ball-bearing belt guide routes the rear drive belt over the pinion gear.

Convert Your M2 USA Into A Pro

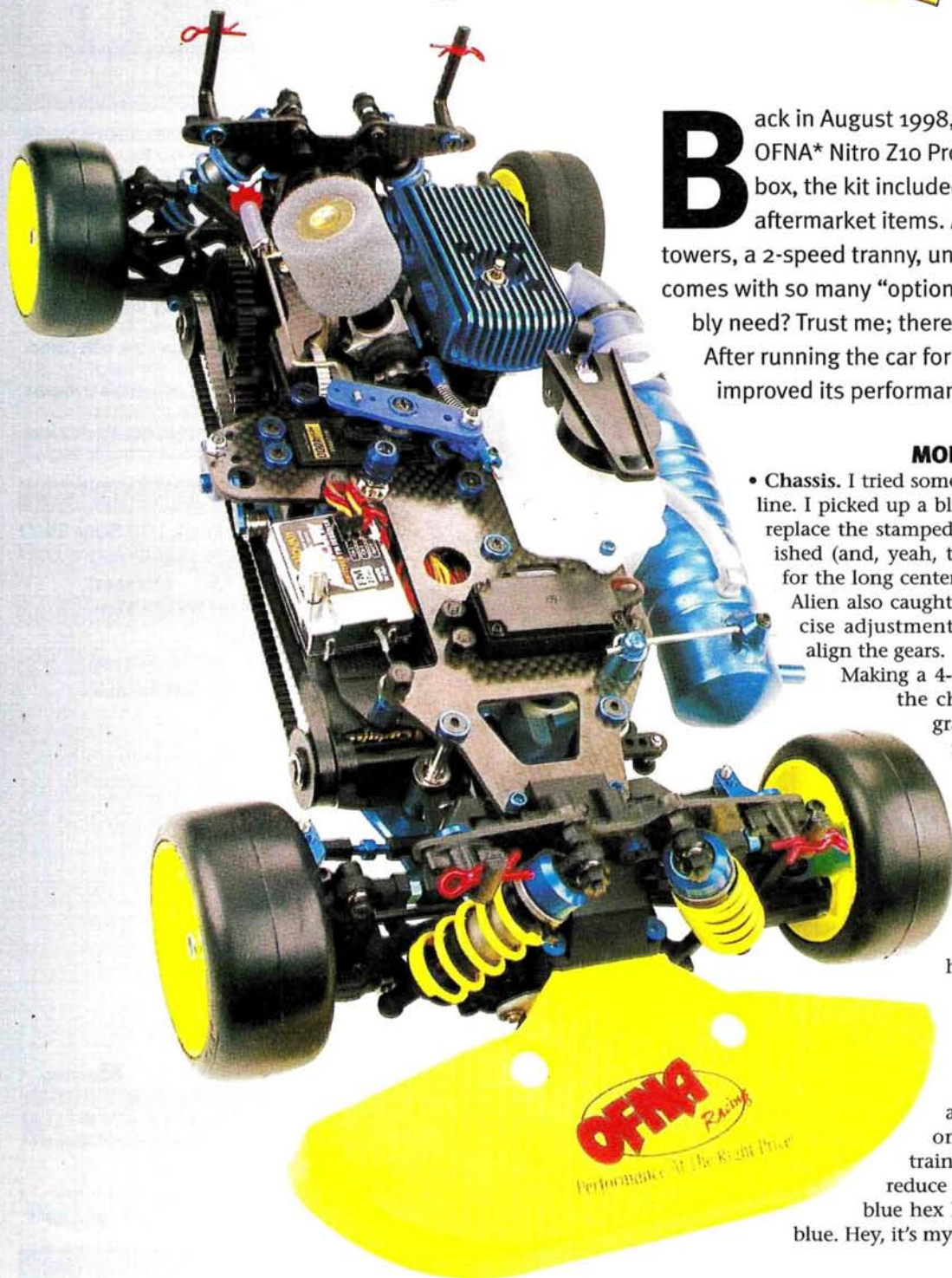
A conversion kit that will turn your M2 USA into a Pro will soon be available. It will include the Pro's chassis plates, blue-anodized-aluminum motor mount and front bulkhead, hardened universal drive shafts and hinge pins, front and rear drive belts, competition front bumper, piano-wire transponder mount and more. Basically, the kit will include everything required to transform the M2 USA into the Pro. It won't be cheap, but it will be less expensive than buying a whole new car kit.

more speed through the corners than its predecessor. Looks as if Yokomo has once again upped the ante in the touring-car game and has laid out a straight flush!

**Addresses are listed alphabetically in the Index of Manufacturers on page 273.*

Tuning and Modifying the OFNA Nitro Z10 Pro

by Greg Vogel



Back in August 1998, I was very excited to get my OFNA* Nitro Z10 Pro up and running. Stock out of the box, the kit included many features that are usually aftermarket items. A graphite radio tray and shock towers, a 2-speed tranny, universals—all in there. If the car comes with so many “optional” parts, what else could it possibly need? Trust me; there is always room for improvement. After running the car for a few months, here’s how I’ve improved its performance and durability.

MODIFYING THE PRO

- **Chassis.** I tried some items from Bruckner Hobbies* Alien line. I picked up a blue-anodized, thick yet light chassis to replace the stamped stock unit. I also bought a more finished (and, yeah, trick-looking) cam-style belt tensioner for the long center belt. Adjustable engine mounts from Alien also caught my eye. They allow easier, more precise adjustment of the engine position to properly align the gears.

Making a 4-cell receiver pack and dropping it into the chassis helps lower the car’s center of gravity. For this reason, I installed the receiver on top of the battery pack, dropped the servo lower into the chassis with spacers (Losi shock standoffs are the perfect size) and flipped the bellcrank’s servo-saver ball stud to keep the turnbuckle level.

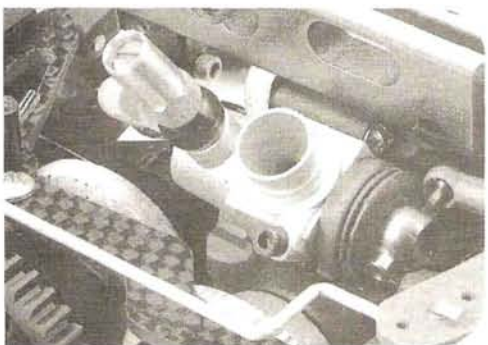
- **Drive train.** The track I regularly run on (R/C Madness, Enfield, CT) has a short straightaway, and a stock 2-speed transmission isn’t really necessary there, so I swapped it for the single speed found on the sport version of the Nitro Z10. The single speed is perfect for my home track and cuts down on rotating mass. My only other modification to the drive train was the addition of MIP’s* CVDs to reduce backlash and binding. I added OFNA blue hex hubs to the axle just because they are blue. Hey, it’s my money.



The stock plastic parts work great. I decided, however, to replace the steering knuckle and inner arm mount with OFNA aluminum units. I could have replaced everything you see here with aluminum but it isn't necessary; some flexing is needed to absorb impacts.

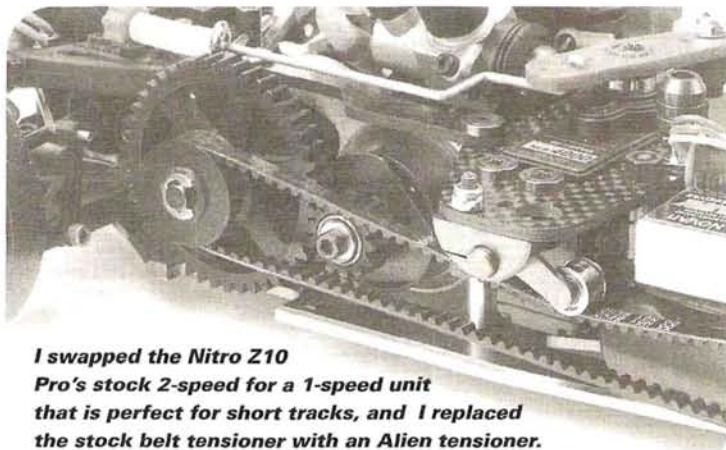
• **Suspension.** I replaced some of the suspension components as a preventive, durability-enhancing move. I chose OFNA's blue aluminum lower bulkheads to replace the stock nylon units and bolted in OFNA aluminum knuckles as well. I had to file the inside of the arms slightly to allow them to pivot freely on the new bulkheads. I also picked up a GPM* tie-rod set to replace the stock steel rods. The set comes with blue aluminum tie rods, ball ends and all the necessary hardware, but I used only the tie rods (I "recycled" the other pieces).

I admit that I didn't rebuild and maintain the car as well as I should have. The shocks were probably the most neglected parts. When I pulled them apart, I was pleased to find that the oil was relatively clean and the inner walls of the shock bodies were still in good shape. While the shocks were disassembled, I installed MIP's gold shock shafts for long-lasting smoothness. I still use 2-hole pistons and 35WT oil all the way around, and I installed OFNA yellow springs on the front dampers and blues in the rear. I added blue OFNA shock caps just for aesthetic purposes.



• **Power.** Next up for a revamp was the OFNA Force Pro .12S engine. First, I completely disassembled it to inspect for wear. The engine was in great shape, but I sprayed everything with Mugen* engine cleaner anyway and reassembled it using after-run oil to lube the parts. I swapped the stock head with a low-profile Alien head. The unit's low-profile design helps lower the car's center of gravity while it maintains a large cooling area. I also swapped the barrel carb for a slide carb. To accommodate the new carb, I had to reposition the servo and rework the linkage. A blue Paris Turbo Ring pipe from Bruckner Hobbies takes care of the exhaust duties.

• **Tires.** To finish the car, I bolted a pair of green-compound Pro-Line* pre-mounted slicks to the front axles and installed yellows in the rear. This combination gives just the right bite on R/C Madness's newly paved surface. Protoform's* Alfa Romeo body tops off my project.



I swapped the Nitro Z10 Pro's stock 2-speed for a 1-speed unit that is perfect for short tracks, and I replaced the stock belt tensioner with an Alien tensioner.

PERFORMANCE

Nitro on-road racing is a lot of fun and can be challenging when the powerful engine unloads. The stock Nitro Z10 Pro is an excellent racer; after all, it comes with a lot of high-performance equipment. But my focus was to bump up performance and durability. Adding aluminum upgrades in critical areas definitely improved durability, and changes in the drive train were a great improvement for my home track. The single-speed transmission was perfect for the short straights and great for getting up to speed out of the turns.

The few changes in the suspension were a great help in the handling department. The rebuilt shocks with the optional springs hooked the car up and allowed me to snap from corner to corner.

I must also give credit to the Force Pro

OFNA's optional slide carb found its way onto my Force Factory .12 engine. To use the slide carb, I had to switch the position of the servo and bolt up OFNA's throttle-linkage kit. Check out the fiber brake disk; to use it, I had to cut the top of the metal brake cam and the cam-retaining plate a little.



On all four corners of this Z10 you'll find smooth MIP CVDs and gold shock shafts. I replaced the stock swaybar with OFNA's optional swaybar; it's mounted on the bulkhead and in front of the arms.

PARTS LIST

OFNA

- Bulkhead (F/R)—part no. 37940/37941.
- Shock caps—37938.
- Steering knuckles—37922.
- Graphite brake plate—37930.
- Rear swaybar—37910.
- Hex drives (blue)—37916.
- Racer spring set—37918.
- Slide carb—57076.
- Arm pin brace—37928.
- Four-shoe clutch—59030.
- Engine-mount screws—10115.
- Concave washers (3mm)—10343.

MIP

- CVD kit—1234.
- Gold shock shaft—1237.

GPM

- Tie-rod set—HN 160.

Bruckner Hobbies

- Special blue-anodized Paris Turbo Ring pipe.
- Alien chassis—WLF010B.
- tensioner—WLF006B.
- head—WLF007B.
- engine mounts—WLF006B.
- muffler standoff—WLF012B.

Pro-Line

- Pre-mounted slicks (Green/Yellow)—2992/2991.

Protoform

- Alfa Romeo body—1419.

HPI

- Fiber brake disk—A844.
- Fuel tank—A800.

Team Associated

- Air filter—7705.

.12S engine. The slide carb gives a quick throttle response—a must if you want to be fast in touring-car racing. The Pro-Line tires keep the car glued to the track. Just remember to rotate them often, as they wear pretty fast, especially on a high-powered nitro car.

* Addresses are listed alphabetically in the Index of Manufacturers on page 273.

TITAN TECH

Hop-Up Parts Flex fighters!

Titan Tech* recently introduced a couple of new components for the RC10GT; they take care of what is considered to be the kit's only weak link: the chassis. Under heavy loads, the chassis flexes in the engine area. This is the result of the cutouts that allow clearance for the engine and the exhaust system. There have been other attempts to cure this, but it seems that Titan's approach is the most successful one.

The company has released a beautifully machined, one-piece aluminum engine mount/chassis brace to replace the stock, two-piece engine mount. The new part spans the gap between the transmission and the fuel tank, and reinforcing braces shore up this weak chassis area. The engine mount/chassis brace's size might lead you to believe that it weighs considerably more than it actually does; it's surprisingly light. The stock mounts weigh in at 1.1 ounces, and the Titan Tech piece weighs 1.7 ounces.

LIKES

- Easy to install.
- High-quality workmanship.
- Blue anodizing matches Factory Team parts.

DISLIKES

- I had to drill two holes for the chassis brace! That's work! (ha, ha).

To install this new unit, you'll have to drill two holes in the chassis, so to complete the job, you'll need a drill bit and a countersink. Even if you install it without drilling the two holes, this brace will do more for chassis rigidity than anything previously available, but for the best results, I recommend that you go all the way.

The second Titan hop-up for the RC10GT is a new upper transmission brace. It spans the same four holes as the stock brace, plus the two holes where the disk-brake assembly is attached to the tranny.

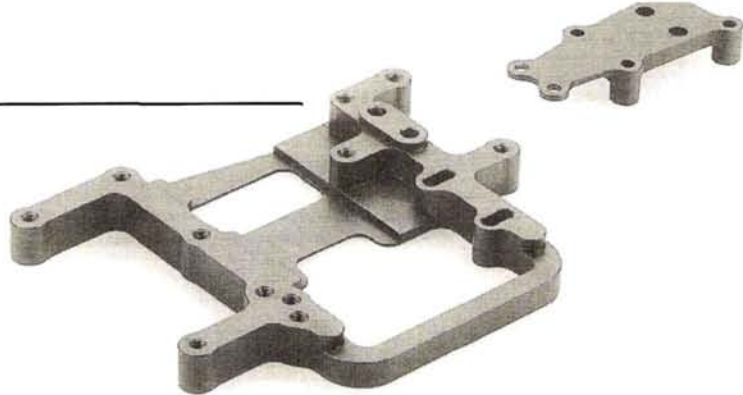
Use Titan Tech's engine mount/chassis brace with the transmission brace, and you'll virtually eliminate chassis flexing! If you don't mind shelling out some more Benjamins to improve your GT, I highly

—Steve Pond

recommend these two new parts.

Part nos. and prices

Engine mount/chassis brace—part no. 01200, \$35.
Transmission brace—01500, \$20.



HAMMAD GHUMAN

Spring clamps, spring retainers and shock mounts for Associated shocks

Add some flash to your
A-Team machines!

There are all sorts of hop-ups out there. Some don't look like much, but they make your car sing on the track. Others don't impact performance significantly, but they're so knock-down, drag-out cool, you just gotta have 'em. Hammad Ghuman's* new suspension components for Associated shocks definitely fall into the latter category. Let's check the parts out from the top of the shocks to the bottom.

• Upper mounts (part no. 5200). These little jewels simply replace the plastic Associated pieces. Since they're aluminum, they can be tightened securely against the shock tower for a solid mount. Once they've been installed, they make no difference to performance, but they should wear better. The upper mounts are also available for Losi vehicles (5201).

• Spring clamps (5210). My favorite of the HG parts. The ingeniously machined clamps have been relieved of all unnecessary material and fit the shock bodies with incredible precision; with half a turn of an Allen wrench, they go

LIKES

- The brightly finished parts look great.
- Spring clamps offer never-gonna-budge clamping power.

DISLIKES

- Not available in colors (natural aluminum only).

from easy-to-adjust loose to can't-budge tight (they use the screws from the stock plastic

clamps). If you've ever stripped out a plastic clamp or had one slide up the shock body during a race, you'll love the HG units. And, of course, they look great.

• Spring retainers (5230). Another glamour item, the brightly finished HG parts replace the stock components for a custom look. There is an argument to be made that the plastic parts could flex during hard use while the rigid aluminum will not, but let's get real: the HG retainers look great, and that's why you want them. That's why I want them! By the way, the retainers also fit HPI shocks.

OK; it's good stuff, but where are the colors? I like the natural look, but color choices are a plus for this fashion slave.

—Peter Vieira



PRO-LINE

Dirt Hawg Buggy Tires All-terrain treads

When it comes to buggy tires, there's a tread for every track, whether it's hard and slick, soft and loamy, rutted and bumpy, or anywhere in between. However, the "single-purpose" treads designed to cope with specific types of terrain aren't suitable for rigorous play, where the fun might be found on pavement, concrete, dirt, grass, wood, linoleum, gravel, or who knows where.

Do these surfaces sound like the kind of terrain you drive on? If they do, you'll be glad to know Pro-Line* has added a new tire to its line just for multi-surface action. The new meats are part of the "Dirt Hawg" line, but don't let the name fool you; these buggy sneakers can handle a lot more than dirt.

The Dirt Hawg buggy tires are heavily lugged, but the tread pattern still presents a "flat" surface because the lugs are broad and close together. The tread design is unidirectional, but I doubt you'll see any performance change if you mount them "backwards." Foam inserts are included to support the soft-compound tread, and molded reinforcing ribs help bolster sidewall strength. I tested the Dirt Hawg III front tires (part no. 1073) and Dirt Hawg I rear tires (1071) on a Team Losi Double-X Sport and used Pro-Line wheels

LIKES

- Go-anywhere tread pattern is great for fun-running.
- Foam inserts are included.

DISLIKES

- 2WD buggies must be outfitted with wider front rims to accept these tires.

The Hawg's chunky treads roll smoothly but still offer good off-road bite. Wide front rims are required for use on 2WD buggies, but the tires are a direct fit on 4WD front rims.



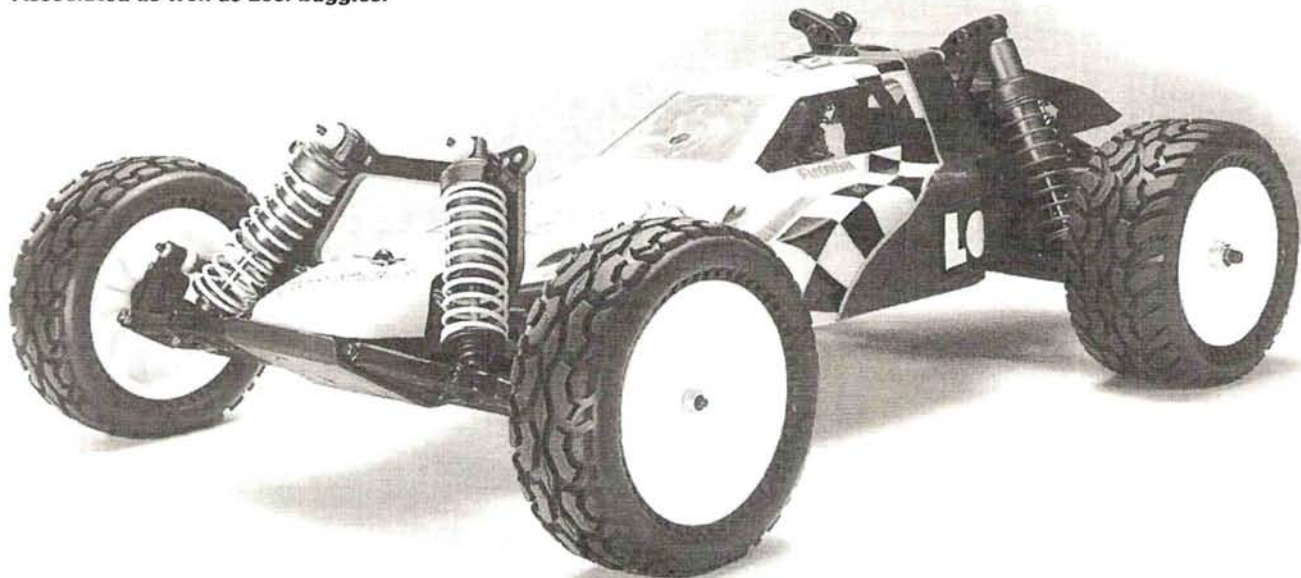
to complete the installation; since the front tires are meant to fit 4WD-width rims, I used Pro-Line's 2640 Wide 2.2 wheels (also available for Associated B2/3, 2639). If you'd like to outfit your Losi, Kyosho, or Yokomo 4WD buggy with Dirt Hawgs, the tires are a direct fit. Unfortunately, the wide rims are not available to fit Traxxas, Kyosho and Tamiya 2WD buggies.

I took the Double-X Sport to the local schoolyard to tackle stairs, tennis courts, parking lots, grass, sidewalks and good ole dirt. Ironically, the dirt was the only terrain on which the Dirt Hawgs didn't offer a lot of traction; the tread pattern is too street-y to provide a lot of grip, but the tires do slide predictably for controllable sprint-style action. The tires hook up very well on pavement, and short grass is no problem.

The Dirt Hawgs' tallish sidewalls flex a bit, which tends to numb on-road handling slightly, but the flex also helped spare the rims from the jolts of hopping curbs and running down stairs (yes, I actually do this). I can't comment on the Hawgs' longevity, since I haven't put more than five packs through the car with the new rubber in place, but they do seem to be wearing well. For all-terrain buggy mayhem, Dirt Hawgs are the tires to get.

—Peter Vieira

The Dirt Hawg buggy tires give any car an aggressive look. The rims shown here are also from Pro-Line and are available to fit Associated as well as Losi buggies.



*Addresses are listed alphabetically in the Index of Manufacturers on page 273. ■



Track Directory

FREE! Track owners! You can be included in this directory brought to you by Pro-Line. Just fill out the coupon on page 269.

YOUR 1999 TRACK GUIDE

Key to Symbols

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Auto lap-counting
- Food available

ALABAMA

Beacon Point RC Raceway, 15717 Beacon Point Drive, Tuscaloosa, AL, 35406; Don, (205) 333-8679

Hobbytown USA Raceway, 450-Q Schillinger Rd. N., Mobile, AL 36608; Rob & Karl Baker, (334) 633-8446

Lagoon Park R/C Raceway, 2730 Lagoon Park Dr., Montgomery, AL 36109; Alex Love, (334) 272-6438

Phenix Raceway & Hobby, 2006 Opelisk Rd., Phenix City, AL 36867; Chris Watson, (334) 298-9786; <http://www.xoom.com/PhenixHobby>

R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, AL 35811; Rick Chambers, (205) 539-1347.

R/C Thunder Tracks, 1530 Schillinger Rd., Mobile, AL 36675; for mail, use 8125-2 Moffett Rd., Semmes, AL 36575; Jerry Hurst, (334) 645-2787

ALASKA

Fairbanks R/C Car Club 510 Juneau Ave. Fairbanks, AK 99701; Dan Anderson, (907) 456-5494

ARIZONA

HobbyTown Mountain Raceway, 1500 E. Cedar Ave., Cedar Hills Shopping Center, Flagstaff, AZ 86004; Richard, (520) 214-9887

HobbyTown Raceway, 13802 N. Scottsdale Rd., Scottsdale, AZ 85250; (602) 948-3946

HobbyTown Raceway, 1915 East Baseline Rd., Gilbert, AZ 95234; Dennis, (602) 892-0405

Hobbytown Raceway, 1102 E. 22nd St., Tucson, AZ 85704; (520) 882-8888

HobbyTown U.S.A., 5030 E. Ray Rd., Phoenix, AZ 85044; Linda McFarland, (602) 598-5282

Kiwanis Park R/C Raceway, 855 Magnolia Ave., Yuma, AZ 85364; Jim Liggett, (520) 539-7148

Quarter Flash's Squirtil' Dirt Raceway, 16301 S. Santa Rita #C, Sahuarita, AZ 85629; Dave, (520) 625-9274

R/C Sports Mania, 3550 N. 35th Ave., Phoenix, AZ 85017; Brian Dick, (602) 278-3671

Scottsdale R/C Raceway, 3023 N. Scottsdale, Scottsdale, AZ 85251; Scott Anfinson, (602) 945-2186

Speedway Hobbies, 2710 N. Steve's Blvd., Ste. 8, Flagstaff, AZ 86004; Gary McAllister, (520) 714-1566

ARKANSAS

Arkansas R/C Car Association, 101 W. 52nd St., N. Little Rock, AR 72118; William Byrd, (501) 753-1286

Airport Speedway, 1521 Airport Loop, Rogers, AR, 72756; Mike Dollar, (501) 636-7123

Grand Slam Superspeedway, 5300 S. Zero St., Ft. Smith, AR 72901; Bryon Shumate, (501) 648-1994

Hobby Town USA, 356 E. Joyce, Fayetteville, AR 72703; Darrell Irvin, (501) 571-3730

Sparks R.C. Raceway, 7194 Greene 721 Rd., Paragould, AR 72450; Tommy Sparks, (501) 239-3606

CALIFORNIA

California City R/C Car Track, 8349 Jacaranda Ave., California City, CA 93505; (760) 373-3765

Castle Hobbies, 14918 Camden Ave., San Jose, CA 95124; (408) 377-3771

Cats West/Hawk's R/C Raceway, 1201 West 10th St., Antioch, CA 94509; Mike Rogers, (510) 779-1665

Cycle Art Raceway, 2211 N. Pleasant Way, Fresno, CA 93705; Jesse Shapiro, (209) 233-3665

Discount Hobby Warehouse, 7750 Convoct Ct., San Diego, CA 92111; (619) 560-9633

Freedom Park Raceway/Ventura Roadrunners, Freedom Park Dr., Camarillo, CA 93010; Chris Jones, (805) 656-RACE

Greater Los Angeles R/C Racing Club, 3756 Cardiff Ave., #305, Los Angeles, CA 90034; Nikko Ko

Hobby Central Raceway, 34255 P.C.H., Unit 107, Dana Point, CA 92629; John, (619) 513-0373

Hobby Central II Raceway, 13461 Community Road; Poway, CA 92064; John, (619) 513-0373

Hobby Paradise Raceway, 1880 Art Gonzales Pkwy., Selma, CA 93662; Steve Keiser, (209) 896-4804

HobbyTown, Parktown Plaza Shopping Center, 1350 S. Park Victoria Dr. #21, Milpitas, CA 95035; (408) 945-6524

Hobby Warehouse, 8950 Osage, Sacramento, CA 95828; Roger Hubbard, (916) 381-7587

Hot Rod Hobbies, 25845 San Fernando Rd., #21, San Luis Obispo, CA 93150; Rod Weisbaum, (805) 255-2404

Jake's Performance Hobbies, 6650 Commerce Blvd., #21, Rohnert Park, CA 94928; Jake, (707) 586-3375

Just for Fun R/C Raceway, 509 S. State St., Ukiah, CA 95482; Don, (707) 462-7305

K&M Raceway, 22474-A Barton Rd., Grand Terrace, CA 92313; (909) 783-0899

Lake Tahoe Raceway/Sierra Hobbies & Raceway, P.O. Box 9969, South Lake Tahoe, CA 96158; Mark Osser or Greg Smith, (916) 541-4555

Lucerne Valley Raceway, 32800 Old Woman Springs Rd., #4, P.O. Box 2047, Lucerne Valley, CA 92356; Frank Rodrigue, (760) 248-7305

M n M Hobbies, 4225 Prado Rd., Ste. 103, Corona, CA 91720; Joe Stanovich, (909) 272-3545

M.R. C.A.R., McGreed Loop, Merced Airport, Merced, CA 95340; (209) 723-6662

Nor-Cal Mini-Speedway, 519 Bush St., Woodland, CA 95695; Steve Van Atta, (530) 668-5678

Perris Recreation R/C Track, 120 N. Perris Blvd., Perris, CA 92370; (909) 943-6603

R.A.C.E., 724 Mangrove Ave., Chico, CA 95926; HobbyTown U.S.A., (916) 899-2977

Race Corner of Marin, 14 Commercial Blvd., #111, Novato, CA 94949; Mike, (415) 883-0388

Race Prep Raceway, 20115 Nordhoff, Chatsworth, CA 91311; Steve Dunn, (818) 709-6800

Racer's Haven Raceway, 7401 White Lane #12, Bakersfield, CA 93309; Martin Buchanan, (805) 835-0441

Radio Control Products, 201 E. Magnolia Blvd., #148, Burbank, CA 91502; Tab, (818) 846-4208

Rams 1/8-scale Gas and 1/16 scale Gas On-Road, Mission College, Lot B, 3000 Mission College Blvd., Santa Clara, CA 95054-1897; Steve Tsuruda, (415) 675-5609

Ranch Pit Shop, 1655 E. Mission Blvd., Pomona, CA 91766; Ken Shintani, (909) 623-1506

Ripon R/C Speedway, 701 N. Acadia Ave., Ripon, CA 95366; Dan Tanis, (209) 599-5160

R.O.C.K.S., 2525 N. Texas St., Fairfield, CA 94533; Mike Learn, (707) 447-0492

Showtime R/C Speedway, 3709 Abbott Dr., Bakersfield, CA 93312; Grant or Karen Kniffen, (805) 589-0493

Simi Valley Groundpounders, 392 C - East Easy St., Simi Valley, CA 93065; Jack Kasten, (805) 584-8211

So. Cal R/C Raceway, 19118 Brookhurst St., Huntington Beach, CA 92646; Jim Blauvelt, (714) 963-7484

S.R.S Offroad Raceway, 1038A N. Davis Rd., Salinas, CA 93907; Randy Loveless, (408) 424-4044

Team Air Racing Club, 18208 Imperial Hwy., Yorba Linda, CA 92686; Don or Nicky, (714) 579-7488

Track Heaven, 6196 Child's Ave. San Diego, CA 92139; Loure, 475-2020

Tri-Valley Auto Racers, Livermore Elks Club, 940 Larkspur, Livermore, CA 94550; Mike Stone, (510) 455-6833

Ultimate Hobbies, 2378 North Orange Mall, Orange, CA 92665; Cliff Murukami, (714) 921-0424

Valley R/C Racepark, 146 S. Santa Fe St., Hemet, CA 92344; Valley Wide Recreation, (909) 925-9331 or (909) 654-1505.

COLORADO

MHOR R/C Raceway, 15540 East Batavia Dr., Aurora, CO 80011; Jess Brockman, (303) 343-0151

S&T R/C Raceway, 323 Auburn Dr., Colorado Springs, CO 80909; Tim Bishop, (719) 574-2910

Valley West R/C Club, 2202 I Road, Grand Junction, CO 81505; Waymond Williams, (970) 242-8846

CONNECTICUT

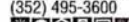
Central CT Auto Racers, Davis Hobbies II, 45A Welles Street, Glastonbury, CT 06033; (860) 633-3056

First Coast Speedway, 6410 Walther Dr., Jacksonville, FL 32211; Bob Thompson, (904) 743-2161

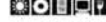

5-Fifty-5 R/C Raceway, State Road 555, Bartow, FL 33830; John Goepferich, (941) 678-9111

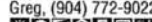

Frontier Race Track, 15260 N.E. 244th Ave., Salt Springs, FL 32134; Harold Reel, (352) 685-2881


GggGggGnnnnnG & C Hobbies 1228 Hypoluxo Rd., Lantana, FL 33462; George, Debbie, or Carol, (561) 547-3812


Gainesville R/C Speedway, P.O. Box 693, Melrose, FL 32666; 130 NW 14th Ave., Gainesville, FL 32601; (352) 495-3600


G & C Hobby Raceway, 1228 Hypoluxo Rd., Lantana, FL 33462; George, 561-547-3812


Greater Orlando Auto Racers, 970 Keller Rd., Altamonte Springs, FL 32714; Rob Michael, (407) 834-9299


Hobby World Raceway, 7273 103rd St., Jacksonville, FL 32210; Greg, (904) 772-9022


The Hobby Stop Raceway, 5765 Manatee Ave. W., Bradenton, FL 34209; Rich Konnen, (941) 798-9638


The Hobby Stop Raceway, 2454 Land O'Lakes Blvd., Land O'Lakes, FL 34639; Rich Konnen, (813) 948-0606


Minnreg R.C. Club, 6340 126th Ave. N., Clearwater, FL 34624; David Fox, (813) 787-6032

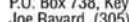

Monster Hobbies, 231 SE 1st Ave., Boca Raton, FL 33432; Steve Augustus, (561) 392-5447


Morris Kohl's Raceway and Hobby Shop, 1202 W. Waters Ave., Tampa, FL 33604; Morris Kohl, (813) 931-1626

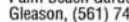

My Rose, 1695 W. Indiantown Rd., Jupiter, FL 33458; Mark Watson, (561) 744-3800


NORRA, 3300 Santa Barbara Blvd., Naples, FL 33999; Jerry Pecar (941) 455-9065 or Mark Benfield, (941) 263-6861


Ocala Radio Control Car Club, 3500 SE 30th Terrace, Ocala, FL 34471; Steve Shook, (352) 694-5147


Paradise Speedway, Mile Marker 98.5 U.S. 1, P.O. Box 738, Key Largo, FL 33037; Joe Ravard, (305) 451-3707


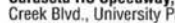
Paul's Stadium Raceway, 4511 W. Dr. M.L. King Jr. Blvd., Tampa, FL 33614; Paul Surette, (813) 872-8662


PBG R/C Motor Park, 6351 Barbara St., Palm Beach Gardens, FL 33418; Doug Gleason, (561) 743-9791 or Tim Case, (561) 627-2608


Pro Hobbies Speedway, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615


Port St. Lucie Racing, 3626 SW Rivera St., Port St. Lucie, FL 34953; Frank Spadavecchia, (561) 336-8711

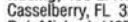

River City R/C Car Club, 9711 Sharing Cross Dr., Jacksonville, FL 32257; Bill Fraden, (904) 268-1948

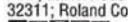

Sarasota RC Speedway, 8475 Cooper Creek Blvd., University Park, FL 34201; Jim Wilson, (941) 358-7047


Sea Coast Watercraft and Hobby, 3119 Barrancas Ave., Pensacola, FL 32507; Vic Lakatos, (850) 457-1493


South Daytona R/C Raceway, 2121 S. Ridgewood Ave., South Daytona, FL 32119; Mike Bean, (904) 426-6481


South Palm Beach Racers, South County Regional Park, West Boca Raton, FL 33486; Mike Fazio, (561) 338-5367

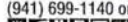

Superior Hobbies R/C Parking Lot Racing, 430 E. Hwy. 436, Ste. #106, Casselberry, FL 32707; Rob Michael, (407) 834-9299


Tallahassee R.C. Raceway, Tom Brown Park, Easterwood Dr., Tallahassee, FL 32311; Roland Costine, (904) 671-2814


Tampa Bay R/C Club, P.O. Box 10224, St. Petersburg, FL 33733; Dick Gillette, (813) 526-0744


Tampa Hobbytown R/C 4 Slot Car Raceway, 15702 N. Dale Mabry, Tampa, FL 33618; Max and Judy Rosenroth, (813) 968-7233


Tropical R/C Raceway, Tropical Park, Miami, FL 33155; Pat Butler, (305) 772-4122


Winterset Raceway, U.S. Rt. 27 South, Winterset Model, Sebring, FL 33872; John Bisbee or Mac Mixer, (941) 699-1140 or (941) 385-4448


GEORGIA

Anthony's Victory Lane, 129 East Hwy 80, Pooler, GA 31322; Anna Stephens, (912) 748-0847


Dalton Raceway, 3036 Parquet Road, Dalton, GA 30720; (706) 226-6699


EEcheconnee Superspeedway, 2149 Richardson Dr., Macon, GA 31206; Andy Thompson or Cliff Kline, (912) 788-8731


EWEEmerald City R.C. Speedway, Highway 40 East, East Dublin, GA, 31021; Terry Cook, (912) 272-3856


The Flight Box Hobby Shop, 3134-C Rockmart Rd., S.E., Rome, GA, 30161-6826; Leslie Duke, (706)-234-3014


Hobby Town Raceway, 2301 Airport Thruway, Columbus, GA 31904; Frank Bastos, (706) 660-1793


HobbyTown Raceway, 225-B Torn Hill, Sr. Blvd., Macon, GA 31210; Marcus Lee, (912) 474-0061


Lake Mayer Raceway, 1430 Dale Dr., Savannah, GA 31406; (912) 598-9709


The Racer's Edge, 1530 Hwy. 19 N., Thomaston, GA 30286; Roger or Mark Walls


Sandy Cross Speedway, Rt. 1, Box 1071, Hwy. 51, Royston, GA 30662; Morris Phillips or Wayne Fowler, (706) 245-9573


SHILOH R/C Raceway, 6362 Shiloh Rd., Hahira, GA 31632; Doug Burnett, (912) 794-2507


Silver Wings Raceway, 5611 Riverdale Rd., College Park, GA 30349; M. Bradshaw, (770) 991-2225


Stinger RC Super Speedway, 3769 Maysville, Rd., Commerce, GA 30529; Deric Sauls, (706) 335-5006 or (706) 335-9044


Sugar Bowl R/C Speedway, 5272 Nelson Brodgon Blvd., Sugar Hill, GA 30518; Shelley Bailey, (770) 945-6709


Valdosta Hobbies, 3998 Inner Perimeter Rd., Valdosta, GA 31602; Ron Hood, (912) 244-2101


HAWAII

A.S.I. Raceway, 4516 Akoa Rd., Kapaa, HI 96746; Arnold Morales, (808) 821-8132


Garden Isle R/C Racers, 5855 Ahakea St., Kapaa, Kauai, HI 96746; Arnold Morales, (808) 823-0856


Kakaako Water Front Park Dragway, 98-029 Hekaha St., Bay #32, Alea, HI 96701; James Inkyo, (808) 487-5155


Keehi Lagoon Park, Leeward Community College, Waipahu, HI 96797; (808) 676-5486


Maui R/C Racing Association, 430 Hookahi St., #13, Wailuku, HI 96793; Tritch R/Hobbies, Radio Control Association, (808) 244-0526


Pearl City Raceway, 98-029 Hekaha St., Bay 32, Alea, HI 96701; James Inkyo, (808) 487-5155


Radio Control Hawaii, 474 Kalanikoa St., S-104, Hilo, HI 96720; Glenn Shiroma, (808) 935-5629

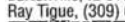

Team PRC Racing Club, 176 Mamo St., Hilo, HI 96720; Charlie Kawamoto, (808) 935-3561

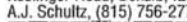

IDAHO

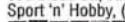
Capital Dirt Burners, 301 N. Bruce, Boise, ID 83712; Mike Ard, (208) 345-3906


Dirt Stuff Plus, 5344 N. Yellowstone Hwy., Idaho Falls, ID 83401; Brian Krah, (208) 522-7576

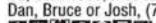

ILLINOIS

Adam's R/C Raceway 7201 S. Adams, Bartonville, IL 61607; Ray Tigue, (309) 633-9300


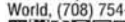
AJ's Raceway & Hobby, 10211 Keslinger Road, Dekalb, IL 60115; A.J. Schultz, (815) 756-2772


C.I.R.C.A., 905 Bibbs St., Jacksonville, IL 62650; Sport 'n' Hobby, (217) 245-1375


C&R Hobbies, 39 E. Jones, Milford, IL 60953; Ray Craighead, (815) 889-4073


Dan's Hobby World, 18415 S. Halsted St., Glenwood, IL 60425; Dan, Bruce or Josh, (708) 754-7988


Gary's R/C Speedway, 1712 East Grove, Rantoul, IL 61866; Gary Dale Flesher, (217) 893-9297

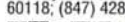

Glenwood Roseway, 18417 Halsted, Glenwood, IL 60425; Don's Hobby World, (708) 754-7988


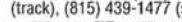
G&R Raceway & Hobbies, 533 Bank Lane, Highwood, IL 60040; Randy Rose, (847) 432-9600

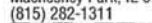

Hans' RC Race Place, 2051 2100th St., Atlanta, IL 61723; Hans Bishop, (217) 648-2915

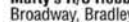

HobbyTown Raceway, 9346 Virginia Rd., Lake in the Hills, IL 60102; Mike Hollingsworth, (847) 458-1777

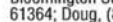

HobbyTown Raceway, 2103 N. Veterans Pkwy., Bloomington, IL 61701; Gary Pritts, (309) 664-4451

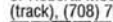

Hopkins Hobbies, 723 South 8th St., Century Plaza, West Dundee, IL 60118; (847) 428-9621


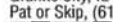
Leisure Hours R/C Raceway, 24121 W. Theodore, Bldg. 1, Plainfield, IL 60544; Scott Hill, (815) 439-1777 (track), (815) 439-1477 (shop)


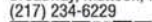
Machesney Park, 1220 Shappert Dr., Machesney Park, IL 61115; (815) 282-1311


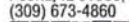
Marty's R/C Hobby, 1335 E. Broadway, Bradley, IL 60915; Gail or Marty, (815) 933-8441


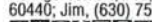
Mitey Motor Speedway, 1109 N. Bloomington St., Rte. 23, Streator, IL 61364; Doug, (815) 672-4212


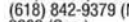
Monee R/C Raceway, 26049 Ridgeland Ave., Monee, IL 60449; Roy or Roberta Moody, (708) 534-2422 (track), (708) 799-5597 (office)


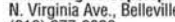
Pontoon Raceway, 3670 St., Rte. 111 Granite City, IL 62040-4304; Pat or Skip, (618) 931-1206


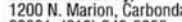
Outlaw R/C Speedway, 1614 Broadway, Mattoon, IL 61938; (217) 234-6229


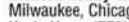
R/C Workshop, 3100 S.W. Adams St., Peoria, IL 61605; Al Kretz, (309) 673-4860


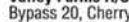
Radio-Active Raceway, 751 N. Bolingbrook Dr., #15, Bolingbrook, IL 60440; Jim, (630) 759-7557


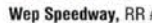
Rector's R/C Raceway, RR 3, Box 104, Albion, IL 62806; Tim Wolfe, (618) 842-9379 (M-F), (618) 446-3282 (Sun.)


Shiloh Eagles Superspeedway, 308 N. Virginia Ave., Belleville, IL 62220; (618) 277-6030


SIRCAR Raceway, 1200 N. Marion, Carbondale, IL 62901; (618) 549-5885


Stanton Hobby Shop, 4718 N. Milwaukee, Chicago, IL 60630; Kevin Kane, (773) 283-6446


Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, IL 61016; Dean or Debbie, (815) 332-4516 or (815) 547-5984


Wep Speedway, RR #2, Box 44 Lawrenceville, IL 62439; Bill Poe


INDIANA

Bremen Racing Ent., 308 N. Bowen, Bremen, IN 46506; Dale Heuberger, (219) 546-3807


Dirt Slinger's Raceway, 546 North 12th Ave., Beech Grove, IN 46107; Phil Riley, (317) 787-3815


Elliott's R/C Raceway, 2140 North Plate, Kokomo, IN 46901; (765) 452-0163


GM Raceway, 1651 W. Franklin St., Elkhart, IN 46516; Pete Russell, (219) 293-1827


Hardesty R/C Raceway, 11 East Plymouth St., Hamlet, IN 4653; Max Hardesty, (219) 867-8600


Hobby Barn Raceway, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773


Hobbytown U.S.A., 5385 E. 82nd St., Indianapolis, IN 46250; Bill Scott, (317) 845-4106


Kokomo Hobby & Radio Raceway, 1108 E. Markland, Kokomo, IN 46901; (765) 457-5060

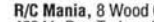

P&T Hobbies and Raceway, RR 2 (Hwy. 60), Mitchell, IN 47446; Paul Weber or Tom Logsdon, (812) 849-6666; email: pnhobby@kiva.net

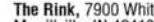

Race Street Hobbies, 1126 1/2 Race St. New Castle, IN 47362; Jim Burke, (765) 521-4888

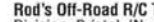

RC Barn, 310 N 125 W, Monroe, IN 46772; Mark Lengerich, (219) 692-6600


R.C.R.C. Raceway of Salina, 1300 E. Crawford, Bill Burke Park, Salina, KS 67401; Calvin Calp, (913) 823-9588


R/C World of Indiana, 2246 West U.S. Hwy. 36, Lynn, IN 47355; Joe Kolp, (765) 874-2464; e-mail: rcworld@globalsite.net; web: www.RCWORLD.com


R/C Mania, 8 Wood Ct., Hebron, IN 46341; Ron Trobaugh, (219) 996-6288 (shop); (219) 762-5365


The Rink, 7900 Whitcomb, Merrillville, IN 46410; Don Reiner, (219) 769-8113


Rod's Off-Road R/C Track, 800 N. Division, Bristol, IN 46507; Rod Harms, (219) 848-7848


IOWA

Delb's Speedway, 423 11th Ave. So., Clinton, IA 52732; Rusti's Miniatures and Hobbies, (319) 243-2697


Dubuque R/C Speedway, Dubuque County Fairgrounds, Dubuque, IA 52001; Paul Conlon, (319) 556-2736


Hobby Haven, 7672 Hickman Rd., Des Moines, IA 50322; Rick Marble, (515) 276-8785


Inside Challenge, 2028 Main St., Keokuk, IA 52632; Jessie, (3

KANSAS

Hobbytown USA, 2016 W. 23rd, Lawrence, KS 66046; Kevin Decembaris, (913) 885-0883


Mike's R/C Hobbies, 121 SE 29th St., Unit #3, Topeka, KS 66605; Mike Barnard, (913) 266-5767


Ottawa Outlaw Raceway, 114 South Main, Ottawa, KS 66067; Tom Wilson, (913) 242-1450


R/C Superdome and T.O. Pro Shop, 14 E. Avenue A, Hutchinson, KS 67501; Cody or Joe, (316) 665-6633


R/C World Raceway, 217 Brownie Ave., Scranton, KS 66537; John and Kyle, (913) 793-2313


RCRC Raceway, 507 N. 4th, Atwood, KS 67730; Bob Dunker, (913) 626-3261


KENTUCKY

Bourbon City Raceway, 213 West Stephen Foster Ave., Bardonia, KY 40004; Ryan Barnes, (502) 349-0069


Johnny's Speedway, 3114 North St., Lloyds Greenup, KY 41144; Charles, (606) 473-0075


Pit Stop Hobbies, 106 A Street, Benton, KY 42025; Robert Fitzgerald, (502) 527-8216

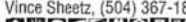

Rick's Hobby Farm, 2089 Park Rd., Hawesville, KY 42348; Rick Early, (502) 927-8527

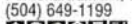

Trio Hobbies & R/C, 216 Redmar Plaza, Radcliff, KY 40160; Maurice Johnson, (502) 351-7547


LOUISIANA

Al's R/C Store, 1529 Anita, Sulphur, LA 70663; Al Gaspard, (318) 625-5880 or (318) 437-8545


Baton Rouge Velodrome, 7122 Perkins Rd., Baton Rouge, LA 70815; Weldon Sharon, (504) 665-5616;


Indy Speedway & Hobby, 3753 General DeGaulle Dr., New Orleans, LA 70131; Vince Sheetz, (504) 367-1891


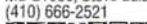
Pontchartrain Hobby Shop, 3755 Pontchartrain Dr., Slidell, LA 70458; (504) 649-1199


MAINE

Clay Bowl R/C Hobbies, P.O. Box 61, Greene, ME 04236; Pat Cap, (207) 946-5003

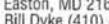

R/C Speedway & Hobbies, 87 Main St., Fairfield, ME 04963; David Prescott, (207) 453-4588


MARYLAND

Cockeysville Astrodome Racers, 10854 York Rd. (rear), Cockeysville, MD 21030; Steve Balaz, (410) 666-2521


Countryside Raceway (portable), 406 Pamela Rd., Apt. C, Glen Burnie, MD 21061; M&J's Promotional Entertainment, (410) 761-6196


Doug's Raceway, 2935 Crain Hwy., Waldorf, MD 20601; Doug Moran, Jr., (301) 843-6220


Hobby Town USA, 8223-11 Elliot Rd., Easton, MD 21601; Bill Dyke, (410) 820-9308


J.R.'s Race Place, 2935 Crain Hwy., Waldorf, MD 20601; James Radford, (410) 947-2766


Outback R/C Race Club, Maiden Lane., Manchester, MD 21102; Randy or Bonnie Henry, (410) 374-2878


The Track, 16806 Oakmont Ave., Gaithersburg, MD 20877; Mimi Wong, (301) 417-9630


MASSACHUSETTS

C&C Hobby & Raceway, 562 Russells Mills Rd., So. Dartmouth, MA 02748; Charlie, (508) 997-4131


Hi-Tech Hobbies, 1681 Broadway (Rt. 138), Raynham, MA 02767; Ruben, (508) 880-5373


Megadrome Raceway, Rt. 8 Curran Mills Rd., North Adams, MA 01247; Bob Blanchette, (413) 743-7223


Northboro Speedway, 168 Main St., Rte. 20, Northboro, MA 01532; Bob Trimble, (508) 393-8087


MICHIGAN

Bobby Rider's Hobby Shop, 22789 Northline Rd., Taylor, MI 48180; Bobby or Fred, (734) 287-7405


Freedom Hill R/C Raceway, 35372 Wellston, Sterling Heights, MI, 48312; Curley Grewe, (810) 776-5483


Hobby Hub, 5859 M99, Diamondale, MI, 48821; Verne Goebble, (517) 337-9278 or (517) 351-5843


House of Hobbies, 2863 West Shore Dr., Holland, MI 49424; (616) 786-3686


JT Superspeedway, W. Golden Ave., Battle Creek, MI, 49015; Jerry or Sam, (616) 965-0116


Larry's Performance R/C's, 43665 Utica Rd., Sterling Heights, MI 48314; Larry, (810) 997-4840

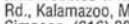

Lazer RC Speedway, 2858 N. Wilmoth Hwy., Adrian, MI 49221; Russ Johnson, (517) 263-2806


MCRC Raceway, 4601 Page Ave., Michigan Center, MI 49203; Sam Sprang, (517) 787-9161


N.M.R.C.C. Raceway, Hobby Toy, Main St., Gaylord, MI 49735; Ed Schneider, (517) 732-3963


Ovaith's R/C Speedshop, Cheeryland Mall, 1732 S. Garfield Ave., Traverse City, MI 49686; Jim Ovaith, (616) 947-6670

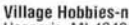

Raw Roots Race Tracks, 14623 East Crosswell 1/4 mile north on 152nd (off U.S. 31), West Olive, MI 49460; Roy Bennink, (616) 399-9338


R&L Hobbies & Racing, 9782 Portage Rd., Kalamazoo, MI 49002; Rex Simpson, (616) 323-3686; fax (616) 329-1744


Rodgers R/C Raceway, 7463 Ridge Rd., Britton, MI 49229; George Rodgers, (517) 451-8301


Thumb Raceway, 3441 Main St., Marlette, MI 48453; Jim Wilson, (517) 635-7848


Vicksburg Off-Road R/C Raceway, 50201 Silver St., Vicksburg, MI 49097; Tim, (616) 323-7963


Village Hobbies-n-Crafts, 195 N. Elm, Hesperia, MI 49421; Alan or Fran, (616) 854-1374


Village R/C Raceway, Prairie Ronde St., Decatur, MI 49045; Chuck Nolke, (616) 423-7878


West Michigan R/C Racers Club, 814 E. Railroad St., Hastings, MI 49058; Doug, (616) 948-2287 or Pat, (616) 945-3873

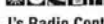

Willis Outdoor R/C Racetrack, 13922 Oakville-Waltz Rd., Willis, MI 48191; Mike Higgins, (734) 587-2012


MINNESOTA

Car Town USA, 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 727-6248


Duey's Hobbies & R/C Raceway, 6600 Cahill Ave., Inver Grove Heights, MN 55076; Duey Carlson, (612) 450-1721


FunCity, 9100 Park Ave., Elk River, MN 55330; (612) 441-8365


Grand Rapids R/C Speedway, 2209 Hwy 2 East, Grand Rapids, MN 55744; Aaron Voges, (218) 326-6751


J's Radio Control Race Park, 22994 290th Ave., Starbuck, MN 56381; Jay Campbell, (320) 239-4827


Northwoods Hobby Raceway, 2638 Hwy 25 North, Brainerd, MN 56401; Tom Grogg, (218) 829-9257


Ray's Raceway Park, 105 3rd Ave. NE, Glenwood, MN 56334; Dan Winter, (320) 634-5246


R/C Racing World, 235 Main Ave. North, Harmony, MN 55939; Mark McKay, (507) 886-5931 or (507) 886-2224


Southside Speedway, 2241 Marion Rd. SE, Rochester, MN 55904; Kevin Guy, (507) 281-3233


Time R/C Raceway, 20 West Lake St., Chisholm, MN 55719; RV, (218) 254-4321


MISSISSIPPI

Joe McFadden Hobbies, 5531 Fox Meadow Dr., Meridian, MS 39307; Joe McFadden, (601) 483-7000


Small Cars Unlimited, 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST; www.smallcarsunlimited.com


MISSOURI

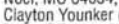
All Seasons Hobby, 29 O'Fallon Square, O'Fallon, MO 63366; Bob Daniels, (314) 281-8767

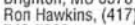

B&L Hobbies & Raceway, 2800 Anchor Dr., Park Hills, MO 63061; Bob Marler, (573) 431-9444


Fire Mountain Raceway, 8647 Commercial Blvd., Pevely, MO 63070; Dan Gordon, (314) 475-6449


Greentree R/C Racepark, St. Louis Dirt Burners R/C Club, Marshall Rd., Kirkwood, MO; (314) 831-2194


North Missouri Raceway, 223 Graves St., Chillicothe, MO, 64601; Billy Johnston, (660) 646-1120


Ozark Mountain Speedway, Rt. #2 Box 50, H-Highway and County Rd. 31, Noel, MO 64854; Clayton Younker, (417) 475-6222


Ozarks R/C Raceway, Hwy 13N, Brighton, MO 65781; Gene Rhodes or Ron Hawkins, (417) 742-4376 or (417) 742-7223


Real Blue Vue Speedway, 12019 E. 47th St., Kansas City, MO 64133; Mark Randol, (816) 358-0238


Real R/C Raceway, 24204 State Rt. 58, Pleasant Hill, MO 64080; Steve Hale, (816) 540-5584


MONTANA

Stormer Raceway & Slot Motorplex, P.O. Box 126 Hwy. 2 East, Glasgow, MT 59230; (406) 228-4569


NEBRASKA

Goodyear Speedway and Off-Road, 4021 North 56th, Lincoln, NE 68510; Tom or Bob, (402) 464-5172


Hadar R/C Raceway, 55192 849th Rd., Norfolk, NE 68701; John Schoenauer, (402) 644-7922


Hobby Town USA Raceway, N 1st St. & Cornhusker Hwy., Lincoln, NE 68508; Ben Smith, (402) 434-5056


Mr. Bill's, 450 West 2nd St., Hastings, NE 68901; Bill J. Ries, (402) 462-4865


O.N.R.O.A.D., 3307 N. 58 St., Omaha, NE 68104; Cook Jacobs, (402) 556-8674


OTWG Carpet Raceway, 55129 849th Rd., Norfolk, NE 68701; John Schoenauer, (402) 644-7922


RC Motorsport Off-Road Raceway, 5600 Mass Rd., Papillion (Omaha), NE 68133; Marty Stepanek, (402) 593-6133


Salvation Army South Corps, 4032 Harrison St., Omaha, NE 68164; (402) 734-3414; fax (402) 734-3415


T & T Raceway, 476 26th Ave., Columbus, NE 68601; Tom, (402) 564-9216


The Speed Zone, 1524 Atokad Rd., South Sioux City, NE 68776; Rob Murdoch, (712) 428-4679, or Jim Carson, (712) 274-7731


Wacha's R.C. Speedway, 1823 23rd St., Columbus, NE 68601; Tom Smith, (402) 564-9216


NEVADA

Dansey's Indoor R/C & Hobbies, 741 N. Nellis, Las Vegas, NV; David Lugo, (702) 453-RACE, (888) 675-8963; www.danseys.com


Lizard Raceway, P.O. Box 1248, Verdi, NV 89439; Jeff Griffin, (702) 345-6573


NEW HAMPSHIRE

Axis Racing R/C Dragway, 4197 High St., Exeter, NH, 03833; Dan Peterson, (603) 659-4877


Economy R/C Speedway, 4 Maple St., Winchester, NH 03470; Harold Thomas, (603) 239-4482 or 239-6470

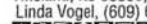

Robert's Railroad & Hobbies, 1335 1st NH Turnpike—Rt. 4, Northwood, NH 03261; Robert M. Jeffers, Jr., (603) 942-5193


RT 106 Racepark, 743 Clough Mill Rd., Pembroke, NH 03275; Fred Farwell, (603) 224-RACE


NEW JERSEY

America's Hobby Center Inc., 8300 Tonnelle Ave., North Bergen, NJ 07047; John Many, (201) 662-0777


Ray's American Raceway, 142 Wilson Ave., Englishtown, NJ 07226; Ray Whitehead, (908) 446-3737


Family Hobbies Raceway, 3576 N.W. Blvd. & Weymouth Rd., Vineland, NJ 08360; Linda Vogel, (609) 696-5790


Jackson R/C Racing, P.O. Box 565, Christopher Columbus Blvd., Jackson, NJ 08527; Al Sodano, (732) 364-6422, or Ed, (732) 928-8963


Jefferson Speedway, 5494 Berkshire Valley Rd., Oak Ridge, NJ 07438; (201) 697-7525


Jerry's Hobby Center & Raceway, 336 Rt. 22W, Greenbrook, NJ 08812; Jerry or Gary, (908) 752-6030


LBRA Track, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122


Millville R/C Oval, 114 N. High St., Millville, NJ 08332; William Denstoz, (609) 327-4640


Pit Stop Dragway, 100 Campus Rd., Totowa, NJ 07512; Kimberly Frank, (201) 956-7223


On Trax Hobbies, 3101 Rte. 70, Browns Mills, NJ 08015; Joseph DiGirolamo, (609) 735-0422


R/C Shag Arena, 690 Jendi Pkwy., Totowa, NJ 07513; Amber Beggell, (201) 956-7223


South Jersey Cost Controlled Racing, 25 Jackson Lane, Sicklerville, NJ 08081; Ray Murray, (609) 629-4809


FootHills R/C Speedway, 3200 Chestnut St., Oneonta, NY 13820; Dave Osterhoot, (607) 432-5098

FRONT

FrogTown Hobbies, Rt. 37, Mini Pines Village, Hogsburg, NY 13655; Dennis White, (518) 358-3686

Hac's Hobbies & Raceways, 120 Cayuga St., Canal View Mall, Fulton, NY 13069; Jack LaTulip, (315) 598-7063

Jerry's Raceway, 111 S. Applegate Rd., Ithaca, NY 14850; Jerry and Lori Achilles, (607) 277-0940

Li 1/4-Scale Racers, 63 Horton Dr., Huntington Station, NY 11746; (516) 351-5384

Long Island Raceway, 168 Broad Hollow, Farmingdale, NY 11735; James, (516) 845-7223

Performance Plus Radio Control Speedway/The Hobby House, 1141 1/2 Jones & Gifford Ave., Jamestown, NY 14701; (716) 468-1772

P.R.O. Speedway, 5 Washington St., Cattaraugus, NY 14719; Marc Pritchard, (716) 257-3101

Radio Hill Raceway, 1219 Shannon Corners Rd., Dundee, NY 14837; Bill Brewer, (607) 243-8641, or Greg Areford (607) 243-7899

Rampage R/C, 27 Fuller Lane, Hyde Park, NY 12538; Brian Walker, (914) 229-1379; (914) 229-2456

R/C Competition Corner, 2202 Brewerton Rd., Mattdale, NY 13211; Lori and Cos Cirriello, (315) 455-8718

Schoharie Co. R/C Car Club, P.O. Box 126, Cobleskill, NY 12043; (518) 922-6982

Silver State R/C Club, Centennial Park, Carson City, NV 89501; (702) 853-3953

Southern Tier Raceway, 88 Paige St., Owego, NY 13827; Anita Harding, (607) 687-5395

South Shore Hobby & Raceway, 464 East Main St., Patchogue, NY 11772; Benny or Bonnie, (516) 758-5567

Tri County Remote Control Car Club, 33 West Decker St., Johnstown, NY 12095; Tom Leville, (518) 725-1279

Tri-state Area Radio Control Model Auto Club (TARMAC), 28/30 Mountain View Rd., Poughkeepsie, NY 12603; Todd (914) 342-5409; Greg, (914) 528-5084; tracksite (914) 454-8276

Walt's Hobby, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291

Westfield R.C. Speedway, 27 Clark St., Westfield, NY 14787; John or Jared Lindstrom, (716) 326-2339; 716-326-2309

Whitestone, 30-56 Whitestone Expy. (Dept. of Motor Vehicles), Flushing, NY 11374; Rudolf Ardilla, (718) 966-6155

ZOAR Road Speedway, 15318 Armes Ct., Gowanda, NY 14070; David & Gordon Ackler, (716) 532-9463

NORTH CAROLINA

A&J R/C Models, 2051 Anthony Rd., Burlington, NC 27215; Jerry Loye or Andrea Thompson, (910) 227-4556; fax (910) 227-1001

FRONT

Another Zito's Mobile MASCARR Inc., 412 E. Blume St., Landis, NC 28088; Carmen Esposito or Pat Youngerman, (704) 451-3293

FRONT

The Antique Barn, 2810 Forest Hills Rd., Wilson, NC 27893; (919) 237-6778

Atlantic Coast R.C., 8-A Lockhead Ct., Greensboro, NC 27409; Charlie Higgins or Harry Johnson (336) 664-1277

Badin Shore Raceway, 1730 Jackson Lake Rd., High Point, NC 27263; Jimmy or Tim Martin, fax (910) 431-6407

C/C Hobby Speedway, 8358 U.S. Hwy. 220 Bus. N., Randleman, NC 27317; Steve & Mary Cox, (910) 495-3482

C&H Raceway, 1400 N. Cannon Blvd., Kannapolis, NC 28083; Camera & Hobby Shop, (704) 933-5321

C/W R/C Speedway, 1297 Charlotte Hwy., Asheville, NC 28730; Billy or Tim, (828) 684-0061

Carolina Dragway, 907-D Warsaw Rd., Clinton, NC 28328; (910) 592-4569

Chatham R/C Raceway, 326 Reno Sharpe Store Rd., Bear Creek, NC 27207; Dwight Fields, (919) 898-2991

Green Flag RC Raceway, 107 Harley Rd., Wilmington, NC 28401; Mike McLemore, (910) 397-0676 or (910) 452-1620

R & D Speedway, 418 Main St., Tarboro, NC 27886; John Dupree, (919) 823-2294

Ride & Slide R/C Raceway, 5319 Yadkin Rd., Fayetteville, NC 28303; Bill Culbertson, (910) 867-4202

R&J Off-Road Racing, 6172 Blalock Rd., Lucama, NC 27851; Robert Williams, (919) 239-0853

Radio Jockey's Parkway, "R.J.'s," Rt. 9, Box 651, Fay, NC 28301; www.wave-net.net/mshutt

Rosewood R/C Speedway, 651 Community Dr., Goldsboro, NC 27530; Glenn Elam, (919) 731-4734

Southern RC Motorsports Club, Hwy. 17S., P.O. Box 1651, Shallotte, NC 28459; Mark Whitt, (910) 754-4902 or Eddie Ferster, (910) 754-8528

Ultratrax, 5505 Palmers Branch, Leland, NC 28451; Mike Williams, (910) 313-0350

NORTH DAKOTA

Hacienda Hills Speedway, 20 Hacienda Hills, Minot, ND 58701; Kenny Duchscherer, (701) 839-4419

Northern Mini Racers, 1000 36th St. SE, Minot, ND 58702; Mike, (701) 838-5818

River City R/C, 2714 Main Ave., Fargo, ND 58103; Chris Hughes, (701) 235-1272

OHIO

American Ohio Sprint Car, 1708 Empire Rd., Wickliffe, OH 44092; Gary Waldhelm, (440) 944-9966

CORCAR/Sams Club, 128 Amity Rd., Gallaway, OH 43119-8732; Bill Stevenson, (614) 870-7159

Columbus R/C Racing Club (C.R.C.R.C.), Franklin County Fairgrounds, Hilliard, OH 43026; Jeff Crowell, (614) 236-1783

D&J R/C Raceway, 801 W. Market St., Orrville, OH 44667; Don Yoder or Mark Nussbaum, (330) 682-4266

FRONT

Dirt Trax, 2206 13th St. NE, Canton, OH 44705; Dan Mauger, (330) 833-3091

Full Throttle Raceway, 600 Mt. Moriah Dr., Cincinnati, OH 45255; Greg Roshan, (513) 943-9009

Fun for All Raceway, 675 College Rd., Batavia, OH 45103; Steve Donaldson, (513) 732-0440

Glass City Radio Control, 2620 Ivy Pl., Toledo, OH 43613; Frank Johnson, (419) 472-1286

Greentown R/C Raceway, 3353 Perrydale, Greentown, OH 44630; Chuck Lambert, (330) 364-6585

Hobby Shop Raceway, 2096 Miami Blvd., Centerville, OH 45459; The Hobby Shop, (937) 436-6161

Hobby World, 3499 SR 59, Ravenna, OH 44266; Tom Fry, fax (330) 296-0894

Lafferty R/C Raceway, Box 153, 70228 Hurrah St., Lafferty, OH 43951; Chris Christman, (614) 968-4818

Lakes Hobbies, 3425 Manchester Rd., Akron, OH 44314; Roy Spencer, (330) 645-6912

Medina R/C Raceway, 754 N. Court St., Medina, OH 44226; Bill Aholt, (216) 723-0255

Mid American Raceway, 13150 Airport Hwy., Swanton, OH 43558; Bill or Chuck, (419) 475-9459

Nothing But Air R.C. Track, 34632 True Rd., Logan, OH 43138; Gary Lloyd, (740) 385-0288

Scoters Hobby Hut, 234 Robbins Ave., #D, Niles, OH 44446; Dave "Scooter" Evans, (216) 544-9411

Shiray's Hobby & RC Raceway, 19930 State Route 117, Waynesfield, OH 45896; Ray Zimmerman, (419) 568-8055

TARCAR, 7216 Nebraska Ave., Toledo, OH 43617; Bill Bridges, (419) 826-3859

Tri-State R/C Auto Racers, Joyce Park, Hamilton, OH, 45011; Ernie Bauhofer, (513) 528-2052

Van Wert R/C Raceway, 144 E. Main St. (above Hoverman Music), Van Wert, OH 45891; Mark Davis, (419) 232-2112

Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (614) 455-3025

OKLAHOMA

Adams Creek R/C Speedway, 5207 S. 194th E. Ave., Broken Arrow, OK 74014; John Beighle, (918) 355-1416

Competition R/C, 100 SE 89th, Oklahoma City, OK 73149; James or Louise Brown, (405) 634-0809

Coweta Hobby & Speedway, 310 S. Broadway, Coweta, OK 74429; Deriald Seabolt, (918) 486-3948

R/C Speedway, 1401 N. Vanburan, Enid, OK 73701; Sean or Jessica Hillery, (405) 237-5504

Remote Control Race Course, 2600 SI-35 Serv. Rd., Moore, OK 73124; Rick or Steve, (405) 993-RACE

Wild Country Speedway, 127 South Main, Porter, OK 74454; Charles McCollough, (918) 685-0372 or (918) 687-1686

OREGON

Competition Racing Association, 17941 NE Gleason, Portland, OR 97230; Mark Taylor, (503) 761-1334

D.I.R.T. (Diamond International Race Track), 65540 73rd St., Bend, OR 97701; Daleyne and Edward Giletz, (541) 388-2932 or 1-800-475-6040, ext. 777

Junior Vehicle Speedways, 3634 Table Rock Rd., Medford, OR 97501; (541) 664-7810

Pit Stop Hobby, 634 N. Coast Hwy., Newport, OR 97365; Richard Wood, (541) 265-2825

R/C Craze Speedway, 300 Ashland Lane, Ashland, OR 97520; Shawn Lazareff, (541) 482-4786

R/C Plus Hobbies Raceway, 185725th St. SE, Salem, OR 97302; Ron Smith, (503) 364-9188

R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501; Gene and Betty Jean Skelton, (541) 779-8298

Yamhill County R/C Car Club, 722 Morgan Ln., McMinnville, OR 97128; Larry Rucker, (503) 472-7234

PENNSYLVANIA

Bachman's Speedway & Hobbies, Box 306, Effort, PA 18330-0306; Jeffrey Bachman, (610) 681-5845

Brookville Hobby Shop, 170 Main St., Brookville, PA 15825; Mark Tonell, (814) 849-7385

Columbia Racing Association, 128 N. Front St., Philipsburg, PA 16866; Lurch Hammal, (814) 342-7114

Cook's Way Raceway, Cook's Way, Mt. Pleasant, PA 16666; Bob Rhodes, (412) 547-5719

Courtview Raceway, 20 S. Main Street (lower level), Washington, PA 15301; Aaron Stimmel Jr., (724) 225-4302

DC Ultra Trax, 13 York Rd., Wycombe, PA 18974; David Cowan, (215) 672-5200

Dreamboat Hobbies, 2810 Pennsylvania Ave. W., Warren, PA 16365; Louie Dussia, (814) 723-8052

Fantasy RC's and Hobby, 2315 W. 12th St., Erie, PA 16505; Frank Francis, (814) 453-6337

Hobby America Raceway, 5 Fitzsimmons St., Duke Center, PA 16729; Dan or Mike Coast, (814) 966-3765

Koontz's Home & Hobby Center, 1205 Hoover St., Pittsburgh, PA 15204; (412) 331-3866

Kranzel's R/C Raceway & Hobbies, 415-B Bosler Ave., Lemoyne, PA 17043; David or Stuart Kranzel, (717) 737-7223

Little Plum R/C Hobbies, RR 1 Box 330, Lock Haven, PA 17745; Larry Luck, (717) 769-1984

Lugnut Raceway, 1713 Bethlehem Pike, Hatfield, PA 19440; Bill Henning or Kathy Anderson, (215) 822-5831

Marshall's R/C Raceway, RR 4, Box 640, Honesdale, PA 18431; Bill or Dot Marshall, (717) 729-7458

The Mushroom Bowl, 960 W. Cypress St., Kennett Square, PA 19348; Bruce or Drew, (610) 444-1850

Pinion Twisters, 3M Plant, Green Ln. and Mitchell, Bristol, PA 19007; Mark, (215) 632-2344 or Tony, (215) 742-3550

Pit Stop Hobbies, 262 W. Main St., Mount Joy, PA 17552; James Stout Jr., (717) 653-6222

Prop & Wheels Raceway, 139 W. Broad St., Tamaqua, PA 18252; Gil Walters, Prop & Wheels Hobbies, (717) 668-2288

The Raceway at River Junction, 1216 4th St. (behind cemetery), Beaver, PA 15009; (412) 728-5571

RC Ave. Raceway, 324 McKinley Ave., Latrobe, PA 15650; Scott Smith, (412) 537-5501

RC Outfitters RCO Raceway, 519 Broadway, Hanover, PA 17331; Chris Shaffer, (717) 633-9490

R/C Pro Speedway, Millville Rd., Bloomsburg, PA 17815; John Swisher, (717) 387-0266; fax (717) 387-4937

R/C Pro III, 910 Chestnut St., Coal Twp. (Shamokin), Shamokin, PA 17866; John Swisher, (717) 648-7763

Riverside Raceway, PA Ave. W & Hickory, Warren, PA 16365; Jeff, (814) 723-4211

S.A. Hi Banks, Hahn's Dairy Rd., Palmyra, PA 18071; Scott Andrews, (610) 826-4583

Sinking Spring Race Center, 237 South Hull St., Sinking Spring, PA 19608; Randy Gelsinger, (610) 670-0760

Staub Bros. R/C Speedway, 31 Locust St., Gettysburg, PA 17325; Todd or Scott Staub, (717) 334-5445

TnT Raceway, Randolph Rd., Great Bend, PA 18821; Frenchie, (607) 775-1750 or Ed Kraft, (717) 967-2604

Trains & Lanes Raceway, 3825 Northwood Ave., Easton, PA 18045; Jeff Setzer, (610) 253-8850, (800) 447-4891

Willow Mill Speedway, 37 N. Season's Dr., Dillsburg, PA 17019; George Verbowitz, (717) 432-4445

Willow Run R/C Raceway, 135 Wright St., Corry, PA 16047; Jim Small, (814) 664-8147

World A.T.L.A.S./P.A.R.C.E. R/C Raceway Hobby Shop & R/C Club, Chester Exchange Mall, 10th & Morten St., Chester, PA 19013; Darryl, Lee or Marc, (610) 874-2540

World A.T.L.A.S./P.A.R.C.E. R/C Raceway, Carr 7787 KM 1.6, Bo Beatriz Adentro, Cidra, Puerto Rico 00739; Humberto (Tito) Lizardi, (787) 739-1572

Dorado Offroad R/C Track, Pista Atletica Bo. Higüillar, Dorado, Puerto Rico 00646; Roberto Lamoso/Jaime Ramos, (809) 796-5603 or (809) 796-1734

Hacienda Muñoz R/C Track, Carr. #14, Juana Diaz, PR 00795; (809) 837-7083

PUERTO RICO

Cidra R/C Track, Carr 7787 KM 1.6, Bo Beatriz Adentro, Cidra, Puerto Rico 00739; Humberto (Tito) Lizardi, (787) 739-1572

Dorado Offroad R/C Track, Pista Atletica Bo. Higüillar, Dorado, Puerto Rico 00646; Roberto Lamoso/Jaime Ramos, (809) 796-5603 or (809) 796-1734

Hacienda Muñoz R/C Track, Carr. #14, Juana Diaz, PR 00795; (809) 837-7083

RHODE ISLAND

SK Hobbies Inc., 15 Carl St., Johnston, RI 02919; Slim or Keith, (401) 453-1440
A000000000

Tri-State R/C Raceway, 205 Hallene Rd., Warwick, RI 02886; Raymond Dean, (401) 738-4908
A000000000

SOUTH CAROLINA

Carolina R/C Speedway, 4148 Calhoun Memorial Hwy., Easley, SC 29640; Craig Prah, (864) 295-1209; www.carolinarc.com
A000000000

Extreme R/C Raceway, 5976 Grace Lane, Myrtle Beach, SC 29577; Kevin Bullock, (803) 236-2083
A000000000

The Grove Racing Center, 939 S. Anderson Rd., Rockhill, SC 29730; Mike Durham or Don Farris, (803) 327-4121
A000000000

Hobbies and More, 1570 S. Main St., Darlington, SC 29532; Jerry Pollard, (803) 393-0355
A000000000

J&M R/C Hobbies, 5341 Dorchester Rd., Evanston Plaza, N. Charleston, SC 29418; Mike Smith, (803) 552-9449
A000000000

Midway Hobby and Raceway, 707 Sulphur Springs Rd., Greenville, SC 29611; Allen A. Dodson, (864) 246-6335
A000000000

ORA Atomic Racing Facility, 373 Boyd Pond Rd., Aiken, SC 29803; Bill Jackson, (706) 855-0846 or (803) 642-0314
A000000000

SOUTH DAKOTA

Action R/C Raceway, 107 N. Main, Mitchell, SD 57301; (605) 996-6895
A000000000

Boomerangs Raceway, 105 N. Main, Hartford, SD 57033; Ed Smithback, (605) 528-7345
A000000000

Dakota Off-Road Racers, 2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604
A000000000

Goldtrax Raceway, 409 E. High, Lead, SD 57754; Steve Brown, (605) 584-2355
A000000000

K&B Speedway, 27283 SD Hwy. #115, Harrisburg, SD 57032; Mike Kosetin, (605) 743-2582
A000000000

R/C Action Raceway, SE Corner at 484th & Hwy. 38, Sioux Falls, SD 57105; Brian Cox, (605) 373-0511
A000000000

TENNESSEE

D&M's Downtown Raceway, 2703 U.S. Hwy. 411S, Maryville, TN 37033; (423) 681-8919
A000000000

Hillside R/C Raceway, 4194 Oakhill Rd., Dayton, TN 37321; John and Rusty Tipton, (423) 775-4739
A000000000

Hobby Town USA, 2000 Mallory Lane, Franklin, TN 37067; Bobby Mills, (615) 771-7441
A000000000

Lawson Raceway, 152 Joel Rd., Oliver Springs, TN 37840; Anthony Lawson, (206) 815-0379
A000000000

Machine-Head Straits, 938 Grandmere Rd., Lawrenceburg, TN 38464; Larry and Eliane Sanders, (615) 762-6630
A000000000

MSA R/C Racing, Rt. 12 Box 489 B, Crossville, TN 38555; D.R. Findley, (615) 456-0027
A000000000

Sparta Raceway Park, 32 N. Main St., Sparta, TN 38583; Carl (Buddy) Elrod, Rt. 5 Box #652, Sparta, TN 38583; (615) 836-8450 or (615) 761-3407
A000000000

TnT Raceway, 643 Loop Hollow Rd., New Tazewell, TN 37825; Cliff Swett, (423) 626-9065 or (423) 869-8942
A000000000

W.O.W. Raceway, 59 Luray Rd., Beech Bluff, TN 38313; Kelly Bean, (901) 427-7874; email: windx60@pipeline.com
A000000000

TEXAS

215 Speedway, 1814 County Road 215, Abilene, TX 79602; Clyde Gardner, (915) 673-2351
A000000000

Big Mike's R/C Raceway, 1405 W. Cotton St. (behind the Locker Room), Longview, TX 75604; (903) 297-7814
A000000000

Comanche Trail RC Park, City Park, Big Spring, TX 79720; Allen Nichols, (915) 263-4241
A000000000

Discount Hobbies, 1722A West Anderson Loop, Austin, TX 78757; Tony Bermudez, (512) 458-2324
A000000000

Drycreek Raceway, 5903 Co. Road 2297, Quinlan, TX 75474; Micky Alphin, (903) 883-4060
A000000000

Eastex Raceway, 45000 Hwy. 59 N., New Caney, TX 77357; Brent Mahaffy, (713) 399-9777
A000000000

Fasttrack Raceway, 301 Edith Drive, El Paso, TX 79924; Hector Gonzalez, fax (915) 779-4524
A000000000

Flip & Spin R/C, 5957 Jones Rd., Bryan, TX 77807; Garland Crabb, (409) 822-7311
A000000000

Hal's Hobby Raceway, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213
A000000000

The Hobby Center Raceway, 4104 Stan Schlueter Loop, Ste. 1, Killeen, TX 76543; Lawrence Remick, (817) 690-7311
A000000000

Hobbycraft Speedway, 819 N. Main St., Corsicana, TX 75110; Keith Hoffman, (903) 872-6761
A000000000

Hobbytown USA, 7676 FM 1960 W., Houston, TX 77070; Fred Pfaffman, (713) 955-7097
A000000000

Hobbytown USA, 999 E. Basse Rd., Suite 177, San Antonio, TX 78209; Joe Sena or Clark Baisdon, (210) 829-8697; fax (210) 829-8707
A000000000

Indy R/C World, 220 Saturn Rd., Garland, TX 75041; Steve Webster, (214) 271-4844; fax (214) 271-4502
A000000000

Issac's Race Track, 18177 Gulf Frwy., Houston, TX 77598; Issac Ben-Ezra, (281) 488-8697
A000000000

Keyser's Hobbies, 1643 Texas, College Station, TX 77840; Bill Bennett, (409) 693-8095
A000000000

MBRC Off-Road Raceway, 204 D&E Valley Lane, Kennedale, TX 76133; (817) 292-5055
A000000000

North Houston Speedway, 11847 Spears Rd., Houston, TX 77067; Bob or Carol Hillin, (713) 872-2471
A000000000

North Texas 1/2 Scale Association, 3905 Sandia, Plano, TX 75023; Dean Densmore, (972) 519-0324
A000000000

Performance Raceway, 11066 Witte Rd., Houston, TX 77055; Jorge Tabush or Terry Schmid, (713) 464-4458
A000000000

Rev It Up Raceway, 3076 Keller Rd., Smithville, TX 78957; Rev, Alton T. Edwards, (512) 360-5443
A000000000

Rick's R/C Raceway, 238 Scenic Loop, Boerne, TX 78000; Rick, (210) 981-2245 or Rich, (210) 590-1805
A000000000

Rough Country, 905 Jacksboro Hwy., Wichita Falls, TX 76701-5310; Robert Kerr, (817) 322-2453
A000000000

Star/Car Raceway, 5802 Patton St., Corpus Christi, TX 78415; Glen Stead, (512) 949-8525; Race Hotline, (512) 881-6105
A000000000

T&T Eagle, 161 W. Spring Creek Pkwy., #601, Plano, TX 75023; Tony Welborn, (214) 517-0562
A000000000

Terminal Velocity R/C Raceway & Supply, 200 Wallington, Ste. 223, El Paso, TX 79902; Rick or Frank, (915) 534-9198
A000000000

Texas Speedway, 6707 Chimney Rock, Bellaire, TX 77401
A000000000

Tiger's Den R/C Speedway, 702 E. Broad St., Mansfield (DFW), TX 76063; Bob Burns, (817) 477-5513
A000000000

T.O. Offroad Raceway, 6236 Quail, El Paso, TX 79924; Efrén Saenz, (915) 821-7522
A000000000

Warehouse Radio Controlled Raceway, 612 W 4th St., Amarillo, TX 79101; Craig or Darren Waddell, (806) 374-6485
A000000000

W.E.S. Hobby Race, 980 S. Fourth St., Beaumont, TX 77701; Edmond Richards, (409) 839-4929
A000000000

Wild Bill's Raceway, 535 E. Shady Grove, Irving, TX 75060; Lynn Morgan or Tom Nix, (214) 438-9224
A000000000

UTAH

Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84044; David Mott, (801) 250-8303
A000000000

Payson R/C Raceway, 955 South Main, Payson, UT 84651; Gus Wood, (801) 224-3852 and Lasca Wood (801) 222-8677
A000000000

Vision Hobby, 352 N. State St., Orem, UT 84057; Ken Rice, (801) 226-6226
A000000000

WOR Raceway, 3170 Brinker Ave., Ogden, UT 84401; Brian Worton, (801) 393-2530
A000000000

VERMONT

Barre Town R/C Club, 14 South Main St., Wall St. Complex, Barre, VT 05641; Russ Tribble or Pete Perreault, (802) 888-2860 or (802) 476-9458
A000000000

Bradford R/C Racing, Main St., Bradford, VT 05033; Seth Bean, (802) 222-9674
A000000000

Stoughton Pond Raceway, Stoughton Pond Rd., Perkinsville, VT 05151; Rick Adams, (802) 263-9321
A000000000

VIRGINIA

Bob's Hobbies & Raceway, 7422 Brandy Creek Dr., Mechanicsville, VA 23111; Bob, (804) 746-2758
A000000000

Brad's Hobbies, 1105 Greenville Ave., Staunton, VA 24401; Brad, (540) 885-3642
A000000000

Brown Brothers Hobbies, 924 North Main Street, Dumfries, VA 22026; Joel or Bob Brown, (703) 221-5746
A000000000

Cooper's R/C Race Center, 4000 Sago Rd. (969), Chatham, VA 24531; Norris Cooper, (804) 724-7342 or (804) 724-4182
A000000000

DRCW Raceway, Debbie's RC World, 2200 Commerce Parkway, Virginia Beach, VA 23454; Les Modlin, (757) 340-6681
A000000000

Gloucester Scale Hobbies, 2352 George Washington Memorial Highway, Hayes Plaza, Hayes, VA 23072; Rob Thein, (804) 642-3484
A000000000

Hobby Hangers Speedway, 14014 D Sullyfield Cir., Chantilly, VA 20151; Kwang or Billy, (703) 631-8820
A000000000

The Hobby House, 116 Edds Ln., Sterling, VA 20165; Oppie, (703) 444-0333
A000000000

KC's Radio Control & Repair, Rt. 4, Box 312, Trents Ferry Rd., Lynchburg, VA 24503; Curtis or Kim Wright, (804) 384-8596
A000000000

Olde Towne Hobby Shoppe, 9105 Center St., Manassas, VA 22110; Arnie Levine, (703) 369-1197
A000000000

Race World Hobbies, 6102 Lakeside Ave., Richmond, VA 23228; Larry Boyd, (804) 553-8040
A000000000

Roadmasters/ Rick's Hobbies, 12201 Balls Ford Ave., Manassas, VA 22110; Rick, (703) 330-6833
A000000000

Shamrock Raceway, 106 Cheviot Place, Stephens City, VA 22655; Scott Janow, (540) 869-3551; Note: track is located in Winchester, VA
A000000000

Thunder Road RC Racing, P.O. Box 1022, Troy, VA 22974-1022; James Palmer, (804) 589-8174
A000000000

The Toteyard, Route 1, Box 235A, Dayton, VA 22821; (540) 828-3476
A000000000

Tracks Hobbies, 1920 E. Pembroke Ave., Hampton, VA 23663; Rick Cardwell, (757) 723-4170
A000000000

Trainlano R/C Racing, 5661 Shoulders Hill Rd., Suffolk, VA 23435; Frank Stevens, (757) 488-5454
A000000000

DRCW Raceway, Debbie's RC World, 2200 Commerce Parkway, Virginia Beach, VA 23454; Les Modlin, (757) 340-6681
A000000000

Gloucester Scale Hobbies, 2352 George Washington Memorial Highway, Hayes Plaza, Hayes, VA 23072; Rob Thein, (804) 642-3484
A000000000

Hobby Hangers Speedway, 14014 D Sullyfield Cir., Chantilly, VA 20151; Kwang or Billy, (703) 631-8820
A000000000

The Hobby House, 116 Edds Ln., Sterling, VA 20165; Oppie, (703) 444-0333
A000000000

KC's Radio Control & Repair, Rt. 4, Box 312, Trents Ferry Rd., Lynchburg, VA 24503; Curtis or Kim Wright, (804) 384-8596
A000000000

Olde Towne Hobby Shoppe, 9105 Center St., Manassas, VA 22110; Arnie Levine, (703) 369-1197
A000000000

Race World Hobbies, 6102 Lakeside Ave., Richmond, VA 23228; Larry Boyd, (804) 553-8040
A000000000

Roadmasters/ Rick's Hobbies, 12201 Balls Ford Ave., Manassas, VA 22110; Rick, (703) 330-6833
A000000000

Shamrock Raceway, 106 Cheviot Place, Stephens City, VA 22655; Scott Janow, (540) 869-3551; Note: track is located in Winchester, VA
A000000000

Thunder Road RC Racing, P.O. Box 1022, Troy, VA 22974-1022; James Palmer, (804) 589-8174
A000000000

The Toteyard, Route 1, Box 235A, Dayton, VA 22821; (540) 828-3476
A000000000

Tracks Hobbies, 1920 E. Pembroke Ave., Hampton, VA 23663; Rick Cardwell, (757) 723-4170
A000000000

Trainlano R/C Racing, 5661 Shoulders Hill Rd., Suffolk, VA 23435; Frank Stevens, (757) 488-5454
A000000000

WASHINGTON

Allie's, 108 South K St., Aberdeen, WA 98520; (360) 533-6638
A000000000

A-Main Raceway, 14011 NE 3rd Ct., Vancouver, WA 98685; Monty Coleman, (360) 571-8404
A000000000

Burien Toyota R/C, 15025 1st Ave. South, Seattle, WA 98148; Ray Meek, (800) 654-6456
A000000000

C&C Raceway, 266 Lind Ave. NW, Revton, WA 98055; Charles Lakin, (206) 227-5167
A000000000

Cedardale Raceway, 1673 Cedardale Road, Mount Vernon, WA 98273; Joe Madonia, (360) 659-0072; e-mail: getchell@halcyon.com
A000000000

Four Season R/C Racing, 2941 Slaughter Kinney Rd. NE, Olympia, WA 98506; Gary and Sharon Brown, (360) 491-2430
A000000000

Hale's R/C Raceway Park, 10611 136th St. E. Puyallup, WA 98374; Walt Hale, (206) 845-7675
A000000000

Hannegan Speedway, 4212 Hannegan Rd., Bellingham, WA 98225; Dana Hoggarth, (360) 734-4090
A000000000

Raceway Hobbies, 188 Sunset Ave. S., Edmonds, WA 98020; Brian Bodine, (425) 774-3285
A000000000

Schmidt's Auto Parts, 10305 Old Hwy. 99, Marysville, WA 98271; Jon Faila, (206) 653-8838
A000000000

Spokane Indoor Raceway, 6422 E. 2nd Ave., Spokane, WA 99212; Dave Mapston, (509) 534-RACE
A000000000

Tacoma R/C Raceway, 6305 6th Ave., Tacoma, WA 98406; Scott Brown, (206) 565-1935
A000000000

Tearor Raceway, Fantasy World Toy and Hobby, 7901 S. Hosmer, Tacoma, WA 98408; Dave Kleinman, (206) 473-6223
A000000000

Ultimate R/C Raceway, 907 Cole St. #3, Enumclaw, WA 98022; Dan Daugherty, (360) 802-2388
A000000000

West Coast Hobby & Raceway, 2239 Stevens Drive, Richland, WA 99352; Darren Shank, (509) 375-4995
A000000000

Zep's Hobbies & Raceway, 530 Interlake, Moses Lake, WA 98837; Steve Ralph, (509) 765-8191
A000000000

WEST VIRGINIA

Burr-Fab Raceway, 90 Davis St., West Union, WV 26456; Mark Travis, (304) 873-2487
A000000000

Fulton's R/C Raceway, 2646 Chapline St., Wheeling, WV 26003; James Fulton, (304) 233-5355
A000000000

Left Turn Hobbies, 100 Saco Ln. (by Post Office), Glen White, WV 25849; Stretch, (304) 255-3930
A000000000

Race Zone, Hopewell Rd., Rt. 8, Box 343A, Fairmont, WV 26554; Joe Clutter (304) 368-1000
A000000000

WVRCR/C Club, 142 West Main, Bridgeport, WV 26330; D.W. Weed
A000000000

WISCONSIN

ABC R/C Inc & Raceway, 244 W. Main St., Waukesha, WI 53186; Dick Mathiesen,

WYOMING

Collectable Creations Off-Road Oval Track, 1790 Deli Range Blvd., Cheyenne, WY 82009; Phil Severson, (307) 632-2156
Wind River R/C Racing Association, 113 S. 3rd E., Riverton, WY 82501; Bob Belding, (307) 857-2068

Xtreme Hobbies Raceway, 2724 Powder Basin, Gillette, WY 82718; Krieb Balls, (307) 682-6077

ARGENTINA

Club A. Velez Sarsfield, Av. J.B. Justo 9000, C.P. 1408, Buenos Aires; Jorge Herrero, 54-01-658-5851

AUSTRALIA

A.C.T. Model Car Racing Club, offroad track—Wanniassa Raceway, Hyland Place, Wanniassa A.C.T.; indoor track—Epic Complex, Northbourne Ave., Canberra North A.C.T.; Gary Davey, 61-6-2871411

Aubry R/C Car Club, Aubry Showgrounds, Aubry, NSW 2640; Ron Langman, 060-247-128

Canberra Off-Road Model Car Club, Goyder St., Narrabundah, ACT 2604; Graham Brown, 61-6-241-3070

Central Coast ORRC, EDSACC Sports Complex, Bateau Bay, N.S.W. Australia 2261; Peter J. Knight, 61-43-693-698

Fast n' Fun, 250 Potreath Rd., Bellbrae West, Torquay, VIC 3228 Australia; Stephen Charr, (613) 5266 1550 or (613) 5266 1556; fax (613) 5266 1556

Illawarra RCECC, Croome Sporting Complex, Albion Park Rail, NSW 2527; Mel or Andrew, 042-714-683

Lakeside R/C Racing Car Club, Hollywood Dr., Lansvale, NSW 2166; R. Bartolozzi, 62-2-907-9800

Melton Electric Circuit Car Association, Safeway Car Park, Corner High St. and Coburns Rd., Melton, VIC 3337; Arthur Joslin, 61-3-9747-8805

Northern Districts Model Rally Club, Inc., Rear Stanford Centre, 16 Stanford Way, Malaga, Western Australia 6066; G. Thirlwell, 61 (9) 249 3855; fax 61 (9) 249 4778; email tony@ois.com.au

Penfield Park, DSTO Complex Salisbury, Adelaide, South Australia 5108; Trevor Unsworth, (618) 8289-5010

Templestowe Flat Track Racers, Templestowe Reserve, Corner of Porter St. and Williamsons Rd., Templestowe, Melbourne, Victoria 31066; Renato Benci, 61 (3) 9553 4625

Wodonga R/C Car Club, 11 Murphy St., Wodonga, VIC 3690; Ron Langman, 61-60-247-128

BELGIUM

ATR-Alka-Tele-Racing, 3570 Stationstraat 21, Alken Limburg; 0032-11-25-49-03

Cartroubles Indoor Buggy Track, Jan Moonsstraat 52-56, 2160 Wommegem, Belgium; Guy Ermes, 32-3-326-51-15; fax 32-3-326-51-01

MBV-Kampenhout, Teniersln 28, Kampenhout B1910, Belgium; Frank Mostrey, phone and fax 0-16-65-75-18

MRCZ, Centrum, De Burg, Belgium; Montie, 75-71-63

Model Racing Club Oudenaarde, Scheidekant, 9700 Oudenaarde, Belgium; A. Chanterle, 32-55-31-36-48; fax 32-55-30-19-12

R.C.R., Peilstraat 43, Retie 2470, Belgium; A. Eelen, phone and fax 32-14-379685

BRAZIL

Amoc Associacao de Modelismo B. Camborio, Junto ao Par Que Ecologico de Bal. Camborio, Bal. Camborio, S.C. 88.330-000; Leo Cesar, (047) 366-0001

Brasilia R/C Motor Circuit, Estacionamento do Estadio Mane Guarrincha, Brasilia, DF 70000, Brazil; Alexandre (Alex), 55-061-273-7205

C.A.A.R. Curitiba Associacao de Automodelismo Radiocontrolado, Rua Theodoro Makioka, n 2300 Santa Candida, Curitiba, PR Brazil, 82650-530; Ronaldo Assumpcao, 55-41-354-2804

Electric Car Club R/C Santos, Av. Bernardino de Campos, 227, Santos, SP, Brazil, 11065-001; Estevam or Arnaldo, 55-013-232-2536

Hobby Center, SQS.210 B.L.H. Apt. 204, Brasilia, DF-Brasil 70.273; 061-242-0488

Hobby Planet Racing Club, Rod Dom Pedro 1, KM 1315, Campinas, Sao Paulo, Brazil 13091901; Daniel, Helio, Luciano, 019 258 2768

Jungle Drive, Rua Alberto Maranhao, No. 219 Icha do Gov. Rio de Janeiro, 21940-490; Paulo Brito (021) 396-0851 or (021) 393-7449

MP Raceway, Av. Nacoes Unidas, 6815 Lapa, Sao Paulo; Gerd Heitrotter, 55-11-9819039; www.hpraceway.com.br

Off Roaders, Av. Guillermo Dummont Villars, 317, Sao Paulo, CEP 05640; Waldir Ielpo, (055) 011-260-5628; fax (055) 011-831-4931

Way of R/C Off-Road Cerrado, Rua Paraiba 1323, 1st floor, Belo Horizonte, Minas Gerais; Claudio T. Corrae, (031) 227-6111, fax (031) 227-6869

CANADA

Action Weelz, 462 Turcotte, Vanier, Quebec, G1M 1R6; Regent Tardif, (418) 527-5756

Advance R/C Raceway, 4181 Sheppard Ave. E., Scarborough, Ontario M1S 1T3; Albert Lau, (416) 321-8377

A&J Toronto R/C Raceway, 24 Main St., Building B, Unionville, Ontario L3R 2E4; (905) 305-1479

The All New R.C. World, 2633 Hwy. #6, Mt. Hope, Hamilton, Ontario L0R 1W0; Dave, (905) 765-2301, Larry, (905) 333-3297 or Brian, (519) 752-0044

ATN, Auto Teleguide Nicolet, 2000 Rue Paul Hubert, Saint-Jean-Baptiste-de-Nicolet, Quebec J3T 1E5; Louis Durand, (819) 293-6097

Auto Sprint, 6065 Des Grands Prairies, St. Leonard, Quebec H3G 2R6; David Kalayjian, (514) 287-3503

Blew Bye You Raceway, 134 Dike Rd., Chilliwack, British Columbia, V2P 5B1; (604) 792-8978

Circuit J.C., 1283 Chemin, St. Philippe, St Polycarpe, Quebec J0P 1X0; Jean Castellon, (514) 265-3675

Circuit Pepsi, Centre de Location, 37 duRoi, Sorel, Quebec, (514) 746-8828

Circuit Plessis, 260 Rang 9 Ouest, Plessisville, Quebec G6L-2Y2; (819) 362-3743

Circuit R/C Pro, 1500 Chemin Sullivan, Val'd'Or, Quebec, J9P 1M1; R/C Modeler Plus, (819) 874-3918

Circuit Teleguide St. Roch, 363-B St. Charles, St. Roch de L'Achigan, Quebec J0K 3H0; (514) 588-4254, fax (514) 588-6554

Circuit Teleguide Grand Prix II, 701, Sainte-Rose, Ste. 200, Quebec, J5R 122; (514) 444-1286

Club Avatt, 244Jules-Richard, Deauville, Quebec J3N 3; Daniel Vanier, (819) 864-6262

Club RCSI, 44 Rue Holliday, Sept-Iles, Quebec G4R; Sylvio Gerard, (418) 968-6575; Hobby Shop, (418) 962-6565

CRCCC, Box 309, Clinton, Ontario N0M 1L0; Eric Russell, (519) 482-9429

CTG, 450 Chemin de la Grand Ligne, Granby, Quebec, (514) 358-4419

CTL, 495 Industriel, Longueuil, Quebec, (514) 358-4419

Dustkickers R/C Raceway, 1785 Cypress Rd., Quessnel, British Columbia V2J 4B1; Darrell Dinsdale, (250) 747-2680

Dynamic Hobbies, 21 Concourse Gate, Unit 6, Nepean, Ontario, K2E7S4; Clark Freeman, (613) 225-9634

East Coast Model Center Raceway, 13 Glen Stewart Dr., Ste 1, Southport, Prince Edward Island C1A 8X9; Gary Stephen, (902) 569-3262

Fast-Trax Speedway, RR 4, Trenton, Ontario; Russ McPeak, (613) 394-6411

Fly'n Bryan's Radical Raceway & Little Shop of Hobbies, RR #1, Ste. 12, Comp. 49, Chase, British Columbia, Canada V0E 1M0; Bryan Coffey/ Dani Potvin, (604) 955-0669

Gilles Coitois, 1458, boul. Lafleche, Bale-Comeau, Quebec, G5C 1E1; (418) 295-1830

Honda House Motor Speedway, 384 Richmond St., Chatham, Ontario N7M 1P9; John Elliot, (519) 354-5530

Interior R/C Raceway, 34-1605 Summit Dr., Kamloops, BC, V2E 2A5; Martin Vannieuwenhuizen, (604) 374-1268 or (604) 374-8458

J-T International Raceway, 127 Milligan Lane, Napanee, Ontario K7R 8A1; N. O'Neill, (513) 354-0099

Leading Edge R/C Speedway, 731 Gardiner St., Kingston, Ontario K7M 3Y5, Canada; Mike and Tony Daicar, (613) 389-4878

Mid-Canada R/C Speedway, 1678 St. James St., Winnipeg, Manitoba R3H 0L3; Richard Driedger, (204) 339-6566

Miniatures & Passions, 204 St. Charles, #103, Ste. Therese, Quebec, Canada J7E 2 B4; Gilles Lachance, (514) 979-7989

MORRAC Raceway, 6449 Crowchild Tr. SW, Box 36060, Calgary, Alberta T3E 7C8; (403) 254-1386

Off-Road R/C Raceway, 76 Eddystone Ave., North York, Ontario M3N-1H4; Ron Lefebvre, (416) 740-0536

Prince George Radio Controlled Car Club, 202 Explorer Cres., Prince George, B.C. Y2M5R8; Doug Waller, (604) 561-0035

Quintrax Speedway, 610 Dundas St. East, Belleville, Ontario K7K 2M1; (613) 962-1414; fax (613) 962-7306

Randy Shantz Raceway, 1015 W. 14th St., North Vancouver, British Columbia; Steve Mulhall, (604) 945-3888

R/C Champ Raceway, 670 Progress Ave., Rear Unit #13-16; Scarborough, Ontario, M1H 3A4; Ben, Matthew or Louie (416) 289-8717

Recreation R/C Raceway, Hwy 16 and Ferry Ave., Prince George, BC; Doug Waller, (604) 561-0035

Ronbo's R/C Racing, RR 1 Glen Walter, Cornwall, Ontario K6H 3G4 Ron Giroux, (613) 936-0176

Rousillon Hobby Track, 177-D St-Jean Baptiste, Chateaugay, Quebec J6K 3B4; (514) 698-2151

Shadetree Raceway, R.R. #4, 22566 Stage Rd., Thamesville, Ontario; Darrin Carbonneau, (519) 692-5211

Sheldon's Raceway, Box 597, Cutknife, Saskatchewan; Sheldon Bradlow, 398-2232

South Muskoka R.C. Track & Mini Putt, 8903 Hwy 11, Orillia, Ontario L3V 6H3; Justin Fortin, (705) 329-0397

Spinnin Wheel Raceway, RR 1, Ariss, Ontario N0B 1B0; (519) 824-1614

South Okanagan Roadhogs, Skaha Lake Rd., Penticton, BC; Willie Lemm, (604) 492-5698

Steeltown Speedway, 3580 Kirk Road West, Binbrook, Ontario L0R 1C0; Paul Snyder, (905) 227-7508

Strathclair Park, Old Garden River Rd., Sault Ste. Marie, Ontario P6A 5T1; (705) 759-1855

Sudbury Organized Auto Racing, 765 Barrydowne Rd., Sudbury, Ontario P3A 3T6; Ken Moore, (705) 524-5339

Thunder Alley Raceway, Lambton Mall, 1360 London Rd., Sarnia, Ontario N7S 1P8; Rob Smith, (519) 882-3361

Vancouver R/C Road Racers, #100-2733 Barney Hwy., Coquitlam, British Columbia V3E1K9; Roger Brown, (604) 945-3888

COLOMBIA

Club De Automodelismo Colombiano, Centro Recreativo Cafam, Kilometro 14 Autopista Norte, Santafe De Bogota, D.C. Colombia; Jorge Delgado, 1-6130588

Club De Automodelismo Colombiano, Centro Comercial Guaymaral, Kilometro 16 Autopista Norte, Santafe De Bogota, D.C. Colombia; Jorge Delgado, 1-6130588

Garoso Raceway, Avenida Libertadores con Diagonal Gran Colombia, Cucuta, Colombia; Gabriel Rodriguez, 975-751892

CYPRUS

Racing Model Club, Kennedy Ave. N. 42, Nicosia, Cyprus; Andrea Sotiriou, 493186; fax 493229

DENMARK

Brondby Motor Club, Roskildevej 460 Brondby, Denmark 2605; Soren Boy Holst, 45-36-472-462

Holstebro R/C Buggy Club, Moztarsvej 7500 Holstebro, Denmark 2600; Michael Brusholt, 45-97-412-734

Klub 144 Raceway, Bagsvaerdvej 144A, 2800 Lyngby, Denmark; Henrik Carstens, 45-42-88-3691

Rainbow Raceway, Eriksvej, 9 Glostrup, Copenhagen 2600; P. Christiansen, 45-52-848-504

Thor Minirace Odense, Sohusevej 255, Allose, Odense, Behind Alsos Hallen (Sport Center), Odense, Denmark; Ulrich Rasmussen, 45-65-303-707

DOMINICAN REP.

Adoca R/C Speedway, Feria Ganadera, Santo Domingo; (809) 220-5266

La Barranquita R/C International Speedway, Santiago; (809) 582-2303

ECUADOR

Hobby Centro A.C.R.O. Club, Via a Turin Km O.S., Cuenca-Ecuador; Teddy Jaramillo, 593-7-831-289; fax 593-7-817082

ENGLAND

Chessington Radio Car Club, Surbiton Sport Club, Riverhill Estate, Worcester Park Rd., Worcester Park, Surrey; Ian Spiller, 0252-20657

Hampshire Racing Center, Viabes Craft Center, Basingstoke, Hampshire; Tony Eudola 44-1276-61402

Hinckley RCCC, Three Pots Inn, A5 Watling St., Hinckley, Leicestershire; Bruce, 01455-890580

Worcester Model Car Club, Christopher Whitehead High School, Bromwich Rd., St. John's, Worcester WR2 6Q9; Mr. Hardy

FRANCE

Auto Model Club de l'ouest, 45 rue de Menez, Lojehet, France 29470; Peuziat Michel, 02-98071764

Auto Electron, 35, rue B. de Ventadour, Limoges, France 87000; M. Boudoul, 55 062763

Crame Roncq, 64 rue du Becquerel, 59370 Mons el Baroeul; Michael Hondekyn, 33-20042755

CSRM, 17 Grande Rue Ave., de Saint-Rambert, 69009 Lyon; Pierre-Yves Monroy, 06 78880852

Lorgies Bolides, rue Beau-Riuz, 62840 Lorgies, France; Mme. Hourdequin Sabine

GERMANY

Dreykorn Raceway, Heuchlinger-Hauptstr. 43, Lauf, 91207; Hermann Hensel, 09123-81457

MC Koln, Bottgerstr., Worringen, Germany 50769; Ralf Habel, 02733-477493

Mini Car Club Dortmund, Kortschstr. 4, 4600 Dortmund 13, Germany; Roland Schwann, 0231/213609

Oberhausen-Altstaden, Am Fesder-turm., Oberhausen, Germany 46099; Josef Holl, 0208-403676

Panik Raceway, Teutonen Str. 5, Troisdorf, Germany 53844; Guido Kraft, 0224-400259



GREECE

EORA-Fanatix Racing, 20 Irinis Ave., Pefki, Athens 15121; Mr. T. Diamandakis, 8025556



GUAM

R/C International Raceway, P.O. Box GK, Agaña; Robert (Buddy) Simpkins, (671) 477-3207



HONDURAS

Autodromo Accion, Quinta Santa Maria, San Pedro Sula, Honduras, Colonia Rivera Hernandez; Eduardo Hondal, (504) 52-2061



HONG KONG

H.K.R.C. Model Car Racing Club, Lot 2130-2137, Ko Po Tsuen, Sha Tau Kok Rd., N.T., Hong Kong; Alex Chan, (852) 659-2822



Kingsville Buggy Arena, Wong Chuk Yeung Village, Shatin, N.T.; Pak Yeung, (852) 607-0828

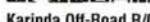


INDONESIA

1st Circuit, Kompleks Villa, Kalijuduh Indah, Surabaya; 62-31-5681965



Cipaku Indah Speedway, J1 Cipaku Indah II/2, Bandung 40143, Indonesia; Cipaku Indah Hotel, Erwin Levi, 62-22-218-228, fax - 62-22-210-223



Karinda Off-Road R/C Car Model Circuit, Perumahan Bumi Karang Indah, J1 Karang tengah Rayam lebak bulus, Jakarta-Selatan 12440; Wawid W. Soedarmadi, 62-21-7900878



Pondok Cabecircut, J.L. Kunir No. 83, Pondok Cabe, Ciputat, Jakarta, Indonesia; Ali Agus Salim, 7403568-9; fax 7491533



Sentul World Hobbies, Citeureup Bogor Jawa Barat, Indonesia; International Circuit Hilton Hartanto, Ian Sentul International Sirkuit, KM 42 62-21-751-2439



ISRAEL

Ircca Off-Road, Rahanana, Israel; Yaron Zafris, (972) 030549937



Nahshoneat, Abba Nile Silver Str. 64, Haifa, Israel 32809; Golan Levy, (972) 039386444 or (972) 04231252



ITALY

Associazione Modellisti Cossato, via P. Maffei, Cossato 13014, Biella, Italy; Zanellato Romildo, 015-405881; fax 015-922709



JAPAN

Xiwakuni R/C Track, PSC 561, Box 978, FPO AP 96310-0978; David T. Eck, 81-6117-53-3662



Yokota R/C Racers, PSC #78, Box 4274 APO AP 96326, Tokyo, Japan; Brad Johnson, 011-813-11-757-7655



Zama Off-Road Raceway, 17th ASGCM Unit 45013, Box 3232, APO AP 96338 Japan; SFC Ken Campbell, 81-3117-63-8478



KUWAIT

Inferno DX 4WD Track, P.O. Box 9167, Ahadi, Kuwait 61002; Yousuf Acqatari



LEBANON

Wild Willy RCC, Oscar St-Jal Eddie, Beirut, Lebanon; 00961-1-403751



MALAYSIA

Titivangsa Raceway, Lot 128, Ampang Park, Shopping Centre, Jalan, Ampang, Kuala Lumpur, Malaysia 50450; R.A.C.E. Sdn Bhd., 03-2614496



Jump Square Arena, Al21, SG, Buloh N/V, 47000, SG, Buloh, Selanhor, Malaysia; Thomson Chong, (603) 656-2513



MEXICO

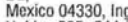
Alces Off Road, Lopez Mateos y Rayod S/N, Ensenada, Baja California, BC 22830; Jorge Bustamante, 667-6-1476, 61477, 86729



Baja Jr., H. Valdez 151 Pte. Y Gmo. Prieto, Los Mochis Sinaloa 81200; Memo Asencio, Gabby Macias, 681-20276; fax 681-26430



Club Kyosho de Automodelismo Departano, Av. Pacifico 216 Coyacan; Ajusco-Toluca Km 15.3 DC, Mexico 04330, Ing. Jorge Perez Holder, 525-544-08096; fax 525-544-7133



Cinamo Coca-Cola, Ruiz Cortines 620 Col. Central de Carga, Guadalupe, Nuevo Leon 67120; Sergio Garza, 83-35-70-09/79-32-33



Hobby Centro, 12 De Diciembre No. 3070-A, Guadalajara, JAL 45550; Alejandro Ortiz Del Toro, 36-21-46-28



Hobby's Formula, Au observatorio 457 DF 01120; 905-502-3620



Hobby Model's Raceway, Blvd. Garcia de Leon, 1555, Morelid, Michoacan 58260; 431-5-01-22



Jaguar R/C Club, Calz. Zavaleta 116, Puebla 72150; Chema, Denise or Chiro, 22-31-00-91, 22-33-00-94



La Hielera, Prol Corregidora Nte 350, Queretaro, QRO C.P. 76160; Jorge Morelos Rabell, 42-12-15-25



Pista Casino, Hotel Casino de la Selva, Cuernavaca, Morelos 16507; Luis Duhart, 73-19-12-38



R/C Racing Club, Obsidiana #2900, Zapopan, Jalisco 44560; Fernando Hernandez, 3-616-73-47



Tony's Track, Obregon 364 Sur, Culicán Sinaloa; Guillermo Prieto, 67-165708-168141



NETHERLANDS

H.F.C.C. Hollandia, De Werf 60, The Hague, The Netherlands; G. de Jong, 031-070-3679820



M.A.C. Vlymen, Hendriklaan 6, Vlymen, Netherlands; Ju Kasteren, 31-73-517906



NEW ZEALAND

Capital Model Racers, Avalon, Lower Hutt, New Zealand; Roger Whitmarsh, 04-566-5714



Counties R/C Raceway, Pukekohe Showgrounds, Station Rd., Pukekohe, New Zealand; R. Northcott, 09-23-86904



Harewood Radio Control Car Club, 550 Sawyers Arms Rd., Christ Church, New Zealand; Dean Johnson, 09-0-3880 344



Papakura Indoor R/C Car Club, 25 Tainere Cres., Papakura, Auckland; Colin Perry, 09-298-4711



Western District R/C Off-Road Car Club, CNV Bancroft/Akatea Prive, Auckland; Chris, 09-838-5201



NORWAY

Aurskog R/C Club, Aursmoen, 1930 Aurskog, Norway; Tommy Gjeleseth, 47-63-86-21-61



Dalen Raceway, P.B. 728, 6401 Molde, Norway; Johnny Reitan, 94 64 52 95



Hadeland Raceway, 2750 Gran, Gran Norway; Dag Bakke-Nilsen, 61330405



Store-Baller Raceway, 2750 Gran, Gran Norway; Ola Raastad, 61330225

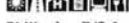


PHILIPPINES

Boyet R/C Hobby Shop, Unit No. 10 Lucas Commercial Center, Marcos Hiway, Decembrat, Antipolo, Rizal; Jose "Boy" Chua, 721-2555



Philippine F1/Touring Club, Super Mall I, EDISA, Quezon City 1156; Raymond Aguilar/Ron Villafior, 896-64-15/23-30-08



Philippine R/C Association, B.F. Homes Paranaque, Metro Manila 1700; Ronald/Manny Villafior, 23-30-08



Quezon City Radio Control Club, Quezon City Memorial Cir., Quezon City; Benjie Lumanlan, 731-94-53



PORTUGAL

Aero Clube da Madeira, Rua do Castanheiro E-2, Funchal, Madeira, Portugal; fax 091-221265



SOUTH AFRICA

Banana County R/C Racing Club, P.O. Box 988, Margate, 4275; Dennis Steenmans, 27-0-391-20975



Frantic Raceway, Santam Plaza, Shop 168, Welkom; Wayne Roodt, fax and phone 27-57-35-72849;



Gordons Bay R/C Club (GBRC), Andrew Norman Sports Centre, Gordons Bay, Cape Province



Heldberg Radio Control Car Club, De Beers Soccer Club, De Beers Ave. Somerset West, Cape Province; Andre Hollander, 024-51-2865



Lowveld Radio Control Thunderdrome, Lion's Club Kanyamazne Rd., Nelspruit, Eastern Transvaal; Martin Van Der Merwe, 01311-534-6415



Parow Radio Car Club, Northern Sports Complex, Parow, Cape Province; Stirling Spengler, 021-945-4957



Phoenix Raceway, 11 Tugela St., Stilfontein, Transvaal; Lionel Edwards, 018-4842863



Pick 'n' Pay Model Car Club, P.O. Box 11654, Klerksdrop 2570; H. Grobbs, (27) 18 46245421



Pietersburg Model Racing, Landros Marais St., Pietersburg, Northern Transvaal; Peter Van Vuuren, 0152-293-0700



R.C. Superbowl, Elsberg Sports Grounds, Elsberg, Johannesburg; Karl Fawcett, 27119076145



R.A.C.E. Off Road, Cecil Payne Stadium, Maraisburg, Gauteng; Derrick Plank, 682-2173



Rustenburg Off-Roaders, Olympia Stadium, Rustenburg, Northwest Province; Jan Van Vollenhoven, 0142-24-846



Pretoria Off Road R/C Club, Joost Bekker Caravan Park, Decemberville, Pretoria, Gauteng; Gert Swart, 012-377-3238



SPAIN

ADAM, Mina Flores de la Sienna, Madrid, Spain Alvaro Sarabia, 01-7471113



A.D. Diabilllos, Morata De Jalon, 50.260 Zaragoza, Spain; Juan Carlos Vicente de Vera, 34-76-605350



Club Modelismo Catilla, P.O. Box 491, Burgos, Spain 09080; A.J. Pereda, 34-47-240130



Club Social Sevillana, Crta. Pulianas S/N, Granada, Spain; Oscar Saenz, 958-275282



Motoclub Castellon R.C., Rafalafena, S/N, 12004 Castellon, Spain; Octavio Traver (34) 64 229705, (34) 64-237411



Outlaw-Ultima II, Puerto Rico 27, Madrid, Spain 28016; Juan Vacas, (34) 915197298



ROACR, Naval Station, Rota, Spain (P.O. Box 53, FPO NY, NY 09540-0013); PO Kelly Sexton, 34-56-82652



CRAEM, La Elipa, Madrid, Spain; Pablo Llorente, 91-3865952



SWEDEN

Amalie Racetrack, Hjort Vagen 14, 5-46632 Sollenbrunn, Sweden; Tage Johansson



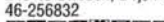
PROCAR Speedway, Industrigatan 8, 430 20 Veddige, Sweden; Lars Nordin, 46-0-340-38784; fax 46-0-340-38694



Sollenbrunn Miniracing Club, Hjortvagen 14, S-446 32 Sollebrunn; Tage Johansson, 46-322-40944



Staffanstorps Highway 1:8 Track, Nummer Ettavagen 5, Vag 108 fran Staffanstorps mot Lund, Staffanstorps 245 45 Sweden; B'rie Petersson, 46 0-46-256832



SWITZERLAND

E.M.B.C.M. Raceway, Mr. Lotfi Zarrouk, Bahnhofstr. 28, CH-8854 Seinen; Markus Schmid 41-1-8605229



ERMC Raceway, 14 Ch de Tavernay, 1218 Grand-Saconnex, Switzerland; M. Maurer, 19-41-22-798-9765



JMRVC-Terraindu Levant, Chemin ou Levant, 1290 Versoix, Geneva, Switzerland; fax 19 41 22 7790805



THAILAND

Bangkok R/C Spa Huamark, 164/1 Lardprao SOI 96, Wangthonglang Bangkok, Bangkok, Thailand 10310; Mr. S. Sanghavas, 662-931-8390; fax 662-587-1186



Hot Rod Raceway—Mr. Chairit Vongphate, 6/3 Soi Soonvijai Phetburi Rd., Hueykwang Bangkok, Bangkok 10310; Mr. Vichai Vongphate, (662) 8602922-5



Radio Control Speedway, 16 Soi Suea-Yai-Uthit, Rajadapisek Rd., Chatujak, Bangkok 10900; Mr. Noppakao and Mr. Suteerapong S., (66-2) 541-6398; fax (66-2) 541-6399



TURKEY

B&B OTO Given Raceway, Gaziosmanpasa Sokak Kadiöky, Goztepe Parki, Istanbul, 0216-4186118, or 0216-3490742



Check out this month's
special offer ...

The opinions expressed on this page do not necessarily represent the opinions of the entire Car Action staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. My email address is: chris@airgame.com.

BY CHRIS CHIANELLI

Chris's BACK LOT

The Secret Life of Quadman!

People are always dissin' me, and I'm sick of it! I'm sick of hearing things like, "Get a life, Quadman; all you do is sit on that machine all day" and "If Quadman had one ounce of sense in that soft plastic body, he'd realize there's a whole world out there. What a molded moron!"

OK; I was going to keep my private life ... private, but now, I'm going to make you guys jealous with what a full life I have when you jerks aren't looking.



The first thing I do when I get home is walk my faithful dog, Dudley, who is, by the way, on first-name terms with Luna.



On Saturday, I enjoy leisure sports like skydiving and surfing and on Saturday nights,



I'm partying big time. I can close down any nightclub doing the twist.



Why, at Chris's last Halloween party, I showed up as the *real* Butt-head. Let me see any of you losers do that!!

And while I'm at it, let me show you plebes a few race-winning tricks you'll never be able to copy either.



I can extend my field of vision while jumping.

I can check directly behind me to see how pathetically far back you wimps are.



And if someone is lucky enough to catch me, I just do my "Exorcist" head-spin thing and freak the sissy right out.



And if, after all that, I still don't win, I can always KICK MY OWN ASS!! Bet you can't do that.



Hey, Chris, I have a question for you. I just bought a new engine, and it came with a boost bottle. What is the main purpose of a boost bottle, and how does it work? I ask because the supplied instruction manual does not say anything about it. If you could help me out, I would be very appreciative.

Thanks.
Ryan

OK, Ryan; judging by the email I get, I can see that clearing up the mystery of the "boost bottle" is overdue.

To understand the boost bottle, Ryan, you have to first understand the nature of our engines—more specifically, the nature of our engines' port timing.

An engine can't be perfectly timed for all rpm ranges. There will always have to be compromises. The 2-stroke glow engines we run are ported for maximum high-end output, so compromises are made in the lower rpm ranges. Here's where those little bottles come in. Since the engines are radically ported for maximum output, they can run a bit rough at the lower end. Did you ever hear a pro-stock or funny-car dragster idle?—anything but smooth.

Radical port timing creates the same effect on full-scale racecar engines, even though they're 4-stroke ignition

types, as it does on our 2-stroke engines.

With our .12-, .15- and .21-size glow engines, this radical porting causes something known as *reversion*. Basically, this is an unwanted reverse flow, of any type, back through the intake porting and/or the carburetor.

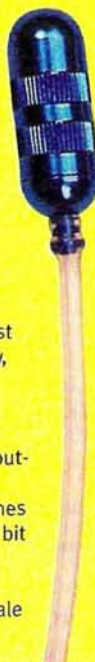
Did you ever run your engine without the filter and notice fuel spitting back out of the carb at lower rpm? This can be most acute during hard acceleration and deceleration and is caused by *reversionary pulses*. The boost bottle, or "intake chamber" as it is sometimes called, smoothes out these pulses simply by giving them somewhere else to go.

The bottle is connected to a brass nipple in the *plenum area* (that's the space between the carburetor and the intake port on the crankshaft) with standard fuel tubing. By connecting the bottle within this plenum area, the peaks of these reversionary pulses are damped *before* they ever reach the carburetor's spraybar and thereby provide smoother airflow within the venturi/spraybar region.

Boost bottles can provide better idle and mid-range throttle transitions—very important indeed! In some cases, fuel consumption even decreases because wasteful fuel "back spitting" is reduced. One thing boost bottles do not do is "boost" peak horsepower.

If you guys need more info on the subject, let me know, and I'll address it in "Piston Power."

—Chris ■



YEAR-END BLOWOUT!!

Authorized Sanyo Distributor

SANYO Single Cells (w/o tabs)

Model #	1.2V/MAH	DxH(mm)	WT(g)	Sale
N-50AAA	50	10.0 x 15.0	3.5	\$2.00
N-700AAC	700	14.0 x 49.5	24	1.60
KR-1100AAU	1100	14.0 x 49.5	27	3.00
N-225AE	225	16.5 x 16.3	12	3.00
KR-600AE	600	16.5 x 27.8	22	2.25
N-1000SCR	1000	22.0 x 33.0	39	4.20
KR-1300SC	1300	22.0 x 42.0	48	2.80
N-1400SCR	1400	22.0 x 42.0	52	4.20
RC-1700	1700	22.0 x 42.0	54	4.50
RC-2000	2000	22.0 x 42.0	58	7.00

Please add \$0.20 per single cell with Solder Tabs

SANYO Power Packs (Flat or Hump)

Model#	V/MAH	LxWxT(mm)	Sale
8N-600AA-4(TYCO)	9.6V/600	102 x 56 x 14	18.00
6N-1500SC	7.2V/1500	135 x 46 x 23	15.00
6N-1400SCR	7.2V/1400	135 x 46 x 23	27.00
7N-1400SCR	8.4V/1400	150 x 46 x 23	31.00
6RC-1700	7.2V/1700	135 x 46 x 23	32.00
7RC-1700	8.4V/1700	150 x 46 x 23	37.50
6RC-2000	7.2V/2000	135 x 46 x 23	46.00
7RC-2000	8.4V/2000	150 x 46 x 23	53.50

Tamiya Conn. comes standard with all Power Packs

SANYO Packs For Radio (Flat or Sqr.)

Model#	V/MAH	LxWxT(mm)	Sale
4N-225AE	4.8V/225	67 x 17 x 17	12.00
4N-700AAC	4.8V/700	56 x 50 x 14	9.00
5N-700AAC	6.0V/700	70 x 50 x 14	11.00
5KR-600AE	6.0V/600	83 x 28 x 17	14.00
8N-700AAC-1	9.6V/700	100 x 29 x 29 (w/wire)	18.00
8N-700AAC-3	10.2V/700	116 x 50 x 14 (w/wire)	18.00

* Add \$3.50 to Connect Specific Radio Connector

* Call us if you can not find your Sanyopack on this list.

hitec

(Serves & Radio systems)

MODEL #	DESCRIPTION	SALE
HS-225BB	Super Low Profile Mini BB (67oz @ .11)	29.99
HS-225MG	Super Low Profile Mini BB (67oz @ .11)	40.99
HS-235-AG	Super Alumn. Low Profile Mini BB (43oz @ .09)	43.99
HS-300	Stuper Sport Servo (49oz @ .16)	9.50
HS-525BB	Hi-Speed 5 Pole BB Servo (55oz @ .12)	32.99
HS-525MG	Hi-Speed 5 Pole BB Servo (55oz @ .12)	44.99
HS-545BB	Hi-Torg. 5 Pole BB Servo (75 oz @ .17)	32.99
HS-605BB	Ultra Torque BB Servo (91oz @ .13)	34.99
HS-605MG	Ultra Torq. Metal Gear BB (91oz @ .13)	45.99
HS-615MG	Super Torq. Metal Gear BB (132oz @ .17)	45.99
HSP1810S	Hi-freq. speed control w/ Ultra mosfets	74.99
HRS0475AM	Lynx AM (75mHz) Radio System	51.99
HRS0475FM	Lynx FM (75mHz) Radio System	85.99

* Call us if you can not find your Hitec item on this list.

* Please specify the desired connector on your Hitec unit.

AIRTRONICS

MODEL #	DESCRIPTION	SALE
94145	Precision Micro coreless BB (33oz/.07sec)	56.99
94102	Precision heavy duty (50oz/.22sec)	12.99
94322	Precision heavy duty BB (50oz/.20)	23.99
94157	Pro RR hi-speed alum. coreless (95oz)	89.99
94158	Pro RR hi-torg alum. coreless (130oz)	89.99
94257	ERG-ZR Hi-speed alum. BB (95oz)	107.99
94258	ERG-ZR Hi-torg alum. BB (130oz)	107.99
90137AM	Rival Sport AM Pistol grip- RV2PS/102(1)	47.99
90220FM	CX2P 2ch FM Pistol grip - CX2P/102(1)	172.99
90280FM	M-8 - 102(2) - in "Z" connector only	289.99

* Call us if you can not find your Airtronics item on this list.

* Please specify "Z" or "Airtronics" connector on your SERVO

Gold Plate Connetors

Male servo lead 12"	2.00	338 DNULTRA(Ultra Deans)	3.00
Male battery lead 12"	2.00	344 APCSET (Sermos)	3.25
Female 2 or 3 wire 12"	2.50	364TAMYSET (without wire)	1.50
Extension 6"	3.50	365TAMY (Tamiya female)	1.50
12"	4.00	366KYOS (Kyosho male)	1.50
Switch w/charger wired	7.00	427MXBNP (banana plugs)	2.50
Exchange adaptors (servo-rx)	3.50	JST (BEC) male, female set	4.00

* Available for Futaba J, Futaba G, JR, Airtronics, Hitec

* Prices Effective 10-1-98 and subject to change without notice
 * Visa & Master card accepted, personal check is held up 10 days
 * S & H is \$5.99 and UPS Cod is no longer accepted
 * All returns subject to inspection and 15% restocking fee



www.cermark.com

Cermark

107 EDWARD AVE., FULLERTON, CA 92833

Info: (714) 680-5888 Fax: (714) 680-5880 Order: (800) 704-6229

DEALERS & MATCHERS INQUIRIES WELCOME

RADIO CONTROL CAR ACTION

CLASSIFIEDS

your R/C marketplace • sell • buy • swap • promote

BUSINESS

R/C BOOKS. Tech Pak including "401 R/C Tech Tips," "R/C Car How To's, Vol. 2," "R/C Car Painting & Finishing Techniques."

Three books for only \$29.95. To order with credit card, call (800) 537-5874.

REPLICA SWISS

WATCHES: 18kt. gold-plates! Lowest prices! 2Y Warranty. Waterproof! (770) 682-1710.

R/C CAR ACTION

DECALS—4x6" sheet (8 logos), only \$2 each; available in blue, Day-Glo green and Day-Glo orange; 6x8" sheet (20 logos), only \$5 each; Day-Glo lime green only. Make check payable to Air Age Inc., and mail to P.O. Box 407, Mt. Morris, IL 61054. Specify quantity, size and color.

WIN A FREE DAHM'S RACING BODY (OF YOUR CHOICE), HAT, AND PRO MASK KIT!

Call Dahm's Racing Bodies at (707) 792-1316, or visit "Hot News" in Dahm's exciting, interactive R/C website at <http://www.dahms-intl.com> for complete details on how you can win our monthly drawing for free prizes. [1/99]

CUSTOM PAINTING

SERVICES: airbrushed art on R/C cars and trucks, R/C boats and helis, cycles and helmets. One-of-a-kind painted bodies, or ready-to-run R/C vehicles. Visa, MasterCard accepted.

Motion Graphics, (410) 848-0008. [1/99]

FUTABA PRODUCTS—27

and 75 MHz: 2-channel AM receivers \$19, crystals \$9; 3003 servo \$9; 2-pc transmitter only \$24.50; 2-pc W/I S3003 servo \$54.99; MC210CB speed control, \$44.95; Sport Racing battery pack 7.2V 1500mAh \$9.99; 7.2V 1400mAh \$9.49; shipping and handling \$3; add \$3.50 for CODs. Mail to Southside Hobbys, 8181 E. Old Ft. Harrison, Terre Haute, IN 47803. Call (800) 782-4164. MasterCard/Visa, money order, checks accepted. [1/99]

NR/CTPA WORLD CHAMPIONSHIP R/C PULLING AND MONSTER/TUFF TRUCK RACING. Information: (716) 627-4321; RCTruckpul@webt.com; www.webt.com/RCTruckpul [6/99]

ALUMINUM CAN

PLANS. Racecars, airplanes, ship. LSASE for list. Tesscar, Box 333C, Scappoose, OR 97056, or <http://members@aol.com/tesscar>. [5/99]

FOR SALE: everything you need to start your own R/C store and track. Full inventory; Losi, Associated, Airtronics, Novak, VIS batteries. Way too much to list. Driver stand, announcer's booth, pit tables, lights, computer with autoscore program, P.A. and cash register. Over \$25K invested. Everything must go! The first \$7K takes it all. For information, call (760) 947-5098. Hisperia, CA. [1/99]

SPRINT CARS: 1/10-scale gas or electric Bart's parts. 602 East Kemp, Watertown, SD; (605) 886-7443. [6/99]

HOBBYIST

ATTENTION R/C CAR RACERS: for sale—4 rolls of Ozite carpet; each roll 12'x75'. Daytona gray, anti-static carpet. \$800. Call (541) 856-3642 [3/99]

CLASSIFIED ADVERTISING ORDER FORM

RATES

HOBBYIST ADS/ NON-COMMERCIAL
 75 cents per word. No business ads of any kind accepted at this rate.

BUSINESS ADS/ COMMERCIAL
 \$1.25 per word. Applies to retailers, manufacturers, etc.

Count all initials, numbers, name and address, city, state, zip code and phone number. Groups of numbers, such as phone, zip, etc., each count as one word.

CLOSING DATE

The 15th of each month, 3 months in advance; i.e., Nov. 15 for the March issue.

PAYMENT

All ads must be paid for in advance. Multiply your payment by the number of months you want it to run.

AD TO READ

(Attach an additional sheet if necessary)

HEADING _____

COPY _____

AAA Hobby Dist., 223
Ace Hardware Hobbies, 238-241
Acer Racing, 198
Aero-Car Technology, 261
Airtronics, 25
America's Hobby Center, 243-245
Andy's Bodies, 201
Associated Electrics, 33, 47, 69, 83, 133, 161
B&B Software, 261
B&T Racing, 222
Bennett Equipment, 222
Boca Bearing, 236
Bolink, 202
Bonzai Motorsports, 253
BRP Racing, 252
Bruckner Hobbies, 145, 180-181
BSR Racing Tires, 51
Byron Originals, 252
Calandra Racing, 222
California R/C Center, 148-153
Cermak, 272
Competition Electronics, 132
Competition R/C Imports Inc., 94
Custom Electric Cars, 252
Deans, 121
DuraTrax, 44-45
ERI Associates, 253
ESP, 261
FMA Direct, 108
Full Speed Racing, 204
Futaba Corp. of America, 50, 262
Genka Trading Corp., 70-71
GHI, 215
Gizmo's, 261
GM Racing, 85, 109, 208-213
Golden Horizons, 103
Great Planes, 166-169
Ground Zero, 260
GTP California, 123
Hammad Ghuman, 63, 65
Hawks R/C, 237
Hitec/RCD, 67, 93
Hobby Etc., 203
Hobby Products Intl., 28-29, 78-79, 127
Hobby Shack, 87, 188-193
Hobby Tech, 221
Hobby World, 186
Hobbytown USA, 176, 260
Horizon Hobby Dist., 19
Innoventive Technologies, 86
Integy, 105
Kawada, 77
KO Propo, 129
Kyosho, 14-17, 125, 195
Lite Machines, 48
LRP, 91
Lucas Racing, 68
Mach 1 Hobbies, 236
Magma Intl., 198
Maxtec Development, 31
MD Planes, 218-219
Megatech, 214
MIP, 154
MRC, 9, 23
Mugen Seiki, 171
New Era, 261
Nitech, 261
Novak Electronics, 11
OFNA Racing, 20-21, 49, 96-99, 165, 200
Omini Models, 232-235
Parma Intl., 147, 260
Peak Performance, 236
Penguin R/C, 261
Precision Model Dist., 236
Pro-Line USA, C3, 6-7, 270, 274
Pro-Match, 253
Progressive Suspension, 237
R/C Car Kings, 179
RC Imports, 194
Robinson Racing, 41
RPM, 199
Savon Hobbies, 248-251
Schumacher, 207
SEI Racing, 206
Serpent, 42-43
Sheldon's Hobbies, 182-185
Sky Hobbies, 170
Stormer Hobbies, 254-257
Tamiya, C2, 26-27, 187
Team Losi, 37, 113
Team Orion, 75, 107, 146, 224-229
Tekin Electronics, 95, 178
Testor Corp., 159
Tower Hobbies, 134-141
Traxxas, 172-175
Trinity, C4, 3, 4, 5, 12-13, 35, 55, 58-59, 106, 205
Tungtai Bearings Ltd., 252
Ultimate Hobbies, 247
Wizard Batteries, 222
World Class Inc., 237
WRAM, 177
XS Speed, 260
Yokomo, 38-39

RADIO CONTROL CAR ACTION (ISSN 0886-1609, USPS 001-087) is published monthly by Air Age Inc., 100 East Ridge, Ridgefield, CT 06877-4606 USA. Copyright 1998, all rights reserved. The contents of this publication may not be reproduced in whole or part without the consent of the copyright owner. Periodical postage permit paid at Ridgefield, CT, and additional mailing offices.

SUBSCRIPTIONS. U.S. and Canada, call (800) 877-5169; fax (815) 734-1223, or set your Web browser to www.airage.com/subscribe.html. U.S., \$34.95 (1 year), \$59.95 (2 years); Canada, \$51.30 (1 year), \$91.35 (2 years). Canadian prices include GST, reg. no. 13075 4872 RT. Elsewhere, call (815) 734-1116; fax (815) 734-1223; \$47.95 (1 year), \$85.95 (2 years). All foreign orders must be prepaid in U.S. funds; Visa, MC and AmEx accepted.

EDITORIAL. Send correspondence to Editors, *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. We welcome all editorial submissions, but assume no responsibility for the loss or damage of unsolicited material. To authors, photographers and people featured in this magazine: all materials published in *Radio Control Car Action* become the exclusive property of Air Age Inc., unless prior arrangement is made in writing with the Publisher.

ADVERTISING. Send advertising materials to Advertising Department, *Radio Control Car Action*, Air Age Inc., 100 East Ridge, Ridgefield, CT 06877-4606 USA; phone (203) 431-9000; fax (203) 431-3000.

CHANGE OF ADDRESS. To make sure you don't miss any issues, send your new address to *Radio Control Car Action*, P.O. Box 427, Mount Morris, IL 61054-9853 USA, six weeks before you move. Please include the address label from a recent issue, or print the information exactly as shown on the label. The Post Office will not forward copies unless you provide extra postage.

POSTMASTER. Please send Form 3579 to *Radio Control Car Action*, P.O. Box 427, Mount Morris, IL 61054 USA.

Airtronics
1185 Stanford Ct.,
Anaheim, CA 92805;
(714) 978-1895; fax (714) 978-1540.

Andy's Hobbies
12546 N. Kendal Dr.,
Miami, FL 33186;
(305) 271-3101; fax (305) 595-2623.

Bich'n Bodies
4903 Cloverfield Rd.,
Pearland, TX 77584;
(281) 485-0375.

Blue Thunder
4105 Fieldstone Rd.,
Champaign, IL 61821;
(217) 355-9511.

Boca Bearing Co.
7040 W. Palmetto Park Rd., Ste. 2304,
Boca Raton, FL 33433;
(561) 998-0004; fax (561) 998-0119;
website: bocabearings.com.

Bruckner Hobbies
2908 Bruckner Blvd., Bronx,
New York, NY 10465;
(718) 863-3434; (800) 288-8185;
fax (718) 863-4002.

Dan's RC Stuff
9525-C Cozycroft Ave.,
Chatsworth, CA 91311;
(818) 700-6912; fax (818) 700-2940.

Dynamite
4105 Fieldstone Rd.,
Champaign, IL 61821;
(217) 355-9511; fax (217) 352-0355;
website: www.horizonhobby.com.

Full Speed Racing (FSR)
3941 Legacy Dr., Ste. 204,
Plano, TX 75023;
(972) 618-7038; fax (972) 618-7637.

Futaba Corp. of America
P.O. Box 19767,
Irvine, CA 92723-9767;
(714) 455-9888; fax (714) 455-9899.

GHI
2376 N. Orange Mall,
Orange, CA 92865;
(714) 921-0322; fax (714) 921-0380.

GPM
distributed by Hobby Etc. Inc.,
650 Amherst St., Greystone Plaza,
Nashua, NH 03063;
(603) 595-8549; fax (603) 595-4959.

GTP California
600-A Anton Blvd. (404),
Costa Mesa, CA 92626;
(714) 756-1219; fax (714) 756-1227.

Hammad Ghuman
6 Tower Heights,
Albany, NY 12211;
(518) 458-8441.

Hitec/RCD Inc.
10729 Wheatlands Ave., Ste. C,
Santee, CA 92071-2854;
(619) 258-4940; fax (619) 449-1002;
website: www.hitecrcd.com.

HPI
15321 Barranca Pky.,
Irvine, CA 92618;
(714) 753-1099; fax (714) 753-1098.

**Kyosho/Great Planes
Model Distributors**
P.O. Box 9021,
Champaign, IL 61826-9021;
(217) 398-6300; fax (217) 398-1104.

JR Racing
4105 Fieldstone Rd.,
Champaign, IL 61821;
(217) 355-9511.

LRP
Wilhelm-Ennsle-Str. 134, 7064
Remshalden, Germany.

MIP
830 W. Golden Grove Way,
Covina, CA 91722;
(626) 339-9008; fax (626) 966-2901;
website: www.miponline.com.

Motion Graphics
2645 Robert Arthur Rd.,
Westminster, MD 21158;
(410) 848-0008; fax (410) 346-7440.

Mugen Seiki Racing
17971 Sky Park Circle, Ste. G,
Irvine, CA 92614;
(949) 475-9505; fax (949) 475-9511.

OFNA Racing
22600 Lambert, Ste. D-1009,
Lake Forest, CA 92630;
(714) 586-2910; fax (714) 586-8812.

Pactra Inc.
distributed by Testor Corp.,
620 Buckbee St.,
Rockford, IL 61104;
(815) 962-6654; fax (815) 962-7401.

Parma/PSE
13927 Progress Pky.,
North Royalton, OH 44133;
(440) 237-8650; fax (440) 237-6333.

Pit Shimizu
distributed by GTP California
(address above).

Precision Model Distributors
155 W. 7th Pl.,
Mesa, AZ 85201;
(602) 655-9888; fax (602) 655-9898.

Pro-Line/Jaco
P.O. Box 456,
Beaumont, CA 92223;
(909) 849-9781; fax (909) 849-2968.

Pro-Match Competition Batteries
2033 S. Palo Verde Blvd.,
Lake Havasu City, AZ 86404;
(520) 855-2226.

Protoform Inc.
P.O. Box 456,
Beaumont, CA 92223;
(909) 849-9781; fax (909) 849-2968.

Reedy Modifieds/Team Associated
3585 Cadillac Ave.,
Costa Mesa, CA 92626;
(714) 850-9342; fax (714) 850-1744.

Ride Competition Parts
distributed by GTP
(address above).

RPM Inc.,
14978 Sierra Bonita Ln.,
Chino, CA 91710;
(909) 393-0366; fax (909) 393-0465.

Schumacher USA
6302 Benjamin Rd., Ste. 404,
Tampa, FL 33634;
(813) 889-9691; (813) 889-9593;
website: www.racing-cars.com.

Speed Max
distributed by GTP California,
600-A Anton Blvd. 404,
Costa Mesa, CA 92626;
(714) 756-1219; fax (714) 756-227.

Stika
distributed by Sky Aviation,
1 Transborder Dr.,
Champlain, NY 12919;
(514) 449-0142.

Tamiya America Inc.
2 Orion,
Aliso Viejo, CA 92656-4200;
(800) TAMIYA-A; fax (714) 362-2250;
website: www.tamiya.com.

Team Associated
3585 Cadillac Ave.,
Costa Mesa, CA 92626;
(714) 850-9342; fax (714) 850-1744;
website: teamassociated.com.

Team Orion
distributed by HPI
(address above).

Tech Racing
distributed by GTP
(address above).

Tekin Electronics
940 Calle Negocio,
San Clemente, CA 92673;
(714) 498-9518; fax (714) 498-6339;
website: www.tekin.com.

Tenth Technology
Shornebury Pear Tree Lane, Shorne,
Kent, England, U.K., DA123JX;
+(047) 482-4444.

Titan Tech
15233 Nubia St.
Baldwin Park, CA 91706
(626) 960-0547, fax (626) 960-0548
email: trccracing@aol.com

Traxxas Corp.
12150 Shiloh Rd., #120,
Dallas, TX 75228;
(972) 613-3300; fax (972) 613-3599;
website: www.traxxas.com.

Trinity Products Inc.
36 Meridian Rd.,
Edison, NJ 08820;
(732) 635-1600; fax (732) 635-1640;
website: www.teamtrinity.com.

Yokomo USA
Airport Business Center, 17951
Skypark Cir., Ste. K,
Irvine, CA 92614;
(714) 252-8663; fax (714) 252-8657;
website: www.yokomousa.com.